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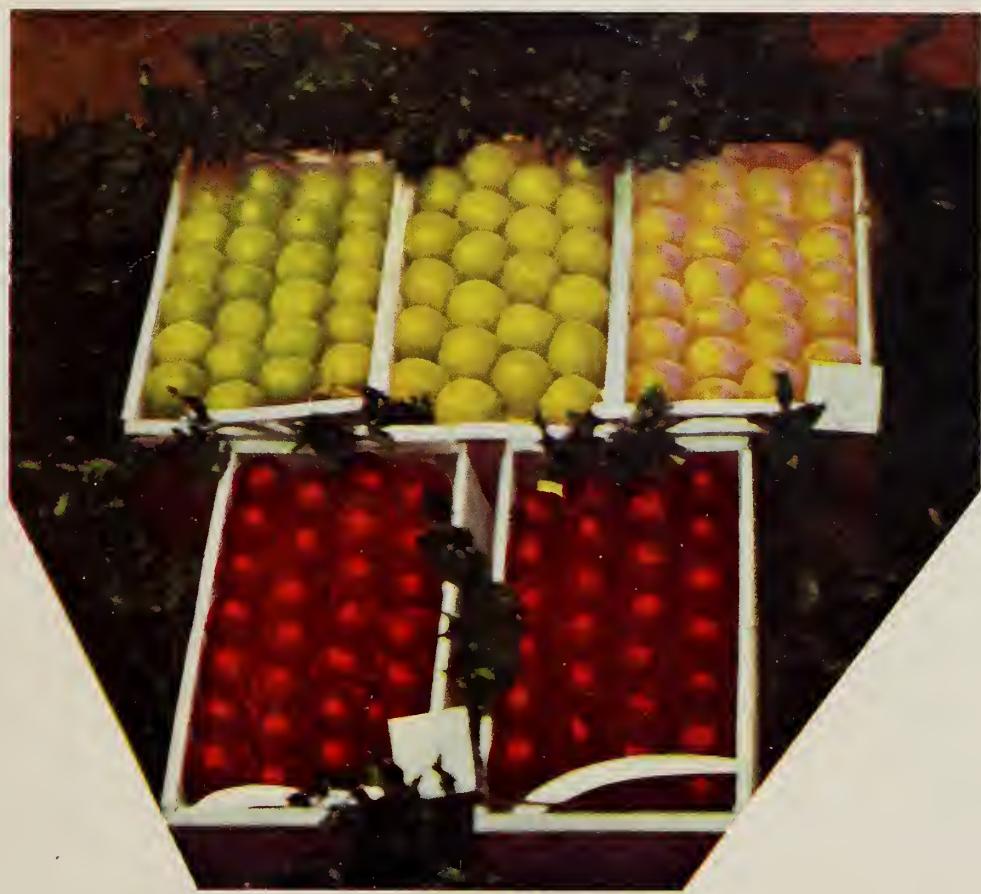
BETTER FRUIT

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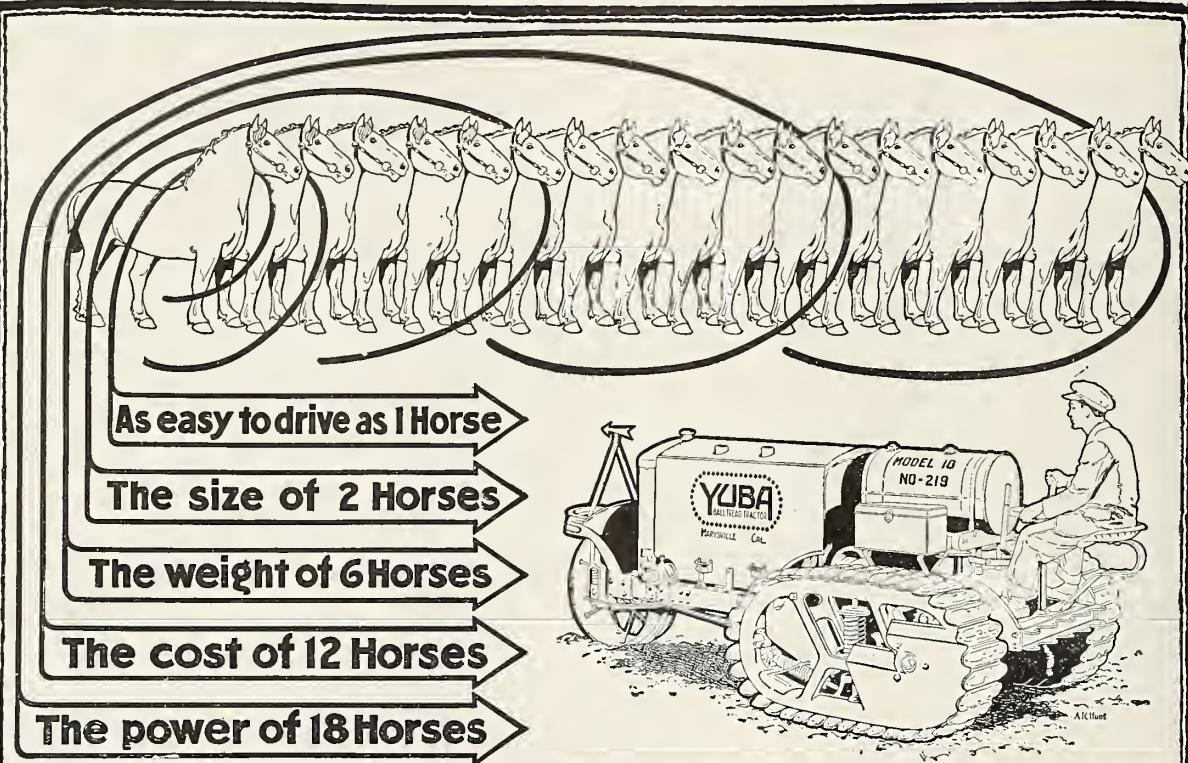
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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Pruning Young Trees

By Professor C. I. Lewis, Oregon Agricultural College, Corvallis, Oregon

MANY orchardists growing young trees have been disappointed with the results they have obtained from pruning. While these disappointments may be due, on the one hand, to a lack of knowledge of some of the fundamental principles underlying pruning, on the other hand, we believe that a very large percentage of the dissatisfaction is due to the fact that the grower has been expecting too much from pruning alone, and has failed to realize the great importance of other orchard practices, such as irrigation, tillage and the maintenance of soil fertility.

No matter how skillfully we prune for fruitfulness, unless we have such soil conditions as to furnish sufficient food and moisture at the right time to develop good, strong buds, we should not expect to secure satisfactory results. Again, we must realize that soil, elevation and climate are factors which have a very close relation to pruning. Likewise, the variety question is always to be taken into consideration. For example, the pruning of Jonathans in Southern Idaho, at an altitude of 2,000 feet, on a silt loam, is an entirely different problem from that of pruning Yellow Newtwns in Western Oregon on a heavy soil at an elevation of 100 feet. While the fundamental principles underlying the pruning of these two trees may be the same, the application of these principles to the two may be radically different.

We need, first, to form a clear understanding of what these principles are, and, second, to study more closely than we ever have in the past the application of these principles to our individual orchards.

The Three Types of Trees

There are three types of trees grown here in the Northwest, the so-called open, globe or vase-shaped tree, the center-leader type and the modified-leader type.

In the vase or open tree three to five branches are chosen to form the framework of the tree; any tendency of a branch to assume the lead is suppressed; no leader being allowed to grow, each of the three to five branches is given equal prominence in the tree. This tree was borrowed from the French and has been modified in this country to suit our special needs; for example, in parts of the Middle West and in California the tree is allowed to carry a large number of laterals, summer pruning or shearing being employed to force out more laterals so as to shade the branches from sun scald.

A dense, compact tree is the result. Here in the Pacific Northwest we seldom use the term "globe" or "vase," but almost always call it the open tree. Instead of shearing to produce shade, our growers prune out and keep the tree open to admit more light. The general framework, however, of the California and Oregon types is the same. Our orchardists claim that the advantage of the open tree is that it allows more light to enter the tree, thus causing a better coloring of the fruit; and, second, it produces a tree that is broad and spreading and easy to keep low-headed. The objections to this tree are, first, that it is generally structurally weak, the scaffold branches issuing at one point, thus making weak crotches, and if one branch breaks out the tree may be ruined; second, this type of tree is used too generally, as it is not adapted to all varieties under all conditions that are found here in the Pacific Northwest.

The so-called leader tree has been used largely in the East on the Atlantic Seaboard, and is used somewhat on the Pacific Coast, especially in British Columbia. There are a few orchards here in the Pacific Northwest where the growers believe the leader to be the

best type. With the leader tree, the center branch is always allowed to have the ascendancy, and the tree grows more or less to the true pyramid. The growers obtain very large trees. It is very difficult, however, to keep them low-headed and to keep them open, but they are probably stronger trees, there being less breakage from this type of tree than from the so-called open tree.

The third type of tree is the modified leader. In this type we start the trees exactly as though we were going to grow the center leader, but, beginning from the second to the fifth year, the leader is suppressed. The advantages of this type of tree are that it allows us to space the branches well, to build strong crotches and main scaffold limbs, and at the same time allows us to keep the tree relatively close to the ground. This type of tree is growing in favor where it has been tried throughout the Northwest.

We would caution the growers, however, that with any of these types of trees, weak trees or strong trees can be built, and also that very bushy or open trees may be attained with any one of the three systems.

The type of growth of trees in your locality may determine to a certain



FIGURE 24—Young Yellow Newtown apple tree before and after summer pruning. Photograph taken in August, 1912.



FIGURE 25—Three-year-old Lambert cherry tree before and after summer pruning early in July.

degree what system you should use. For example, we wouldn't grow the Wagener ordinarily as an open type of tree. It is rather an upright grower for a few years, but later becomes a feeble grower. On the other hand, we should not think of growing varieties like the Tompkins King or Northern Spy as center trees. They shoot up too straight, are too big and are too hard to control. The Yellow Newtown is too often pruned as a typical open tree, and on light soils becomes very weak when twelve or fifteen years of age. A modified leader, or in some cases even the old-fashioned leader, would be better with the Yellow Newtown. On the other hand, on some very strong loams, the Yellow Newtown can be handled very satisfactorily when grown as an open or globe-shaped tree, provided we take a little care in spacing the branches carefully the first two or three years.

The Height of Head

The height of head is only a relative term. One man would say that thirty inches was a low-headed tree; another man would say that this was extremely high. The Pacific Coast grows low-headed trees. We have found by experience that these are the easiest to care for, that they are the most economical for thinning, harvesting, spraying and pruning, and that we can shade the trunks and main scaffold limbs better with this type of tree than with a high-headed tree. In parts of the Inland Empire they often head their trees very low, about eight or nine inches. Many of the Jonathans in the Rocky Mountain district, and in certain portions of Idaho, Eastern Oregon and Washington, are headed in this way and are giving satisfactory results. Under such conditions they must protect the trees as much as possible

against sun scald. However, in Western Oregon we would consider 20 to 25 inches a better height of head. Many growers have felt that about 20 to 25 inches is the proper height for apples and pears. Peaches should be headed very low, as low as they can be grown. Cherries should be headed at about 25 inches. Prunes should be headed at about 30 to 35 inches. We used to believe that walnuts should be headed very high, 7 or 8 feet, and no laterals allowed to grow the first few years, but we are finding this was a mistake, and that about 35 inches will make a splendid head for walnuts.

Season for Pruning

Here in the Northwest, in speaking of seasons for pruning, we generally only consider two seasons, namely, the winter and summer. We receive many letters in regard to early fall or late spring pruning. There is no question but that in the Northwest, where mild winter conditions prevail, winter pruning may be done safely most years at any time when the trees are dormant. In those sections of severe winter conditions, we would advise delaying the pruning as late as possible before the growth starts in the spring. Very rarely would we advise fall pruning in the Northwest, unless one has such a large acreage that it is going to be impossible to complete it unless the pruning is commenced early in the season. If it becomes necessary to prune trees in the fall or very early winter, we would suggest that the growers prune the older trees first, leaving the younger trees for the last pruning. We would caution against pruning trees when they are frozen, and would advise delaying pruning until freezing weather is over. Much heart rot and dieback has resulted from pruning frozen trees. It is possible to prune trees somewhat even after they come out fully in the spring. This is especially true with peaches, and will be discussed in another section of this article.

As regards summer pruning, this is becoming of such interest and importance that we shall treat it under a special head.

Three Lessons to Learn in Pruning Young Trees

There are three great fundamental underlying principles connected with the pruning of young trees. You might say that there are three lessons, and that if these are mastered the problem

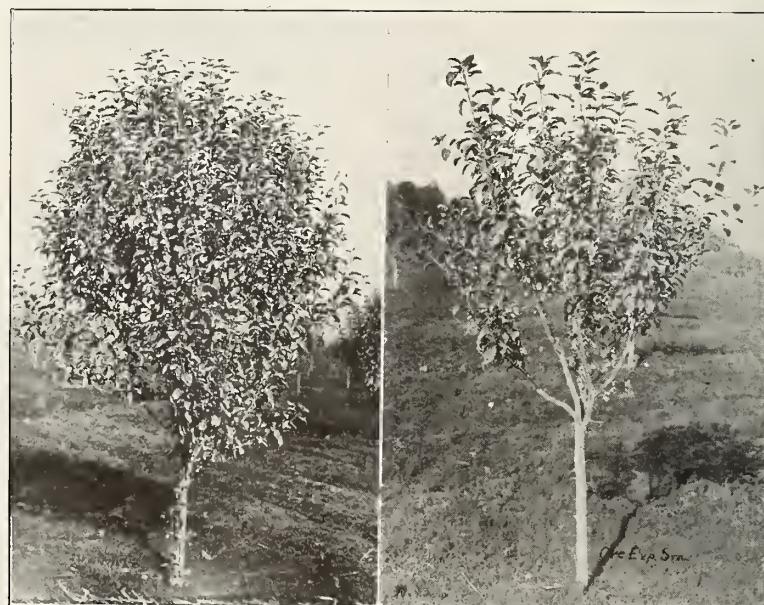


FIGURE 26—At left: Vigorous five-year-old Wagener tree pruned in July. Photograph taken in October. Note that there has been a vigorous response of new shoots averaging fully one foot in length as a result of the summer pruning. At right: Five-year-old Wagener apple tree of less than average vigor pruned in July. Photograph taken in early October. There has been practically no growth response as a result of the pruning.

of pruning young trees becomes rather simple, but unless they are mastered it is difficult to develop strong, well-balanced young trees.

Lesson 1. To Choose and Space the Scaffold Branches.—If you grow an open or modified leader type of tree, four or five branches are what we recommend. If you grow the typical leader tree it does not make as much difference, as from year to year new branches are added. We prefer here in Oregon the four or five-branched tree. While it may be true that the three-branched tree will produce three branches that average larger in diameter than if four or five are allowed to grow, nevertheless we feel that the three-branched tree is a dangerous one; that it is structurally weak; that if you lose one of the three branches you have practically a ruined tree; whereas, with four or five scaffold limbs, you can lose a branch and still balance the tree in such a way as to save it. The first lesson, then, is to choose four or five well-spaced branches, having them issue in a whorl around the tree, if possible, and having them as far apart as they can be conveniently spaced. The farther apart they are spaced, the stronger and better will be the trunk and the better the tree obtained. To do this you must not neglect the tree as soon as it is headed, but must watch it very carefully the first month or two after it is set out. It will be necessary to rub certain undesirable buds off, to remove certain undesirable branches, or possibly to suppress from time to time certain branches which tend to run away with the tree. By observing these simple rules you can build a stronger tree. It is for this reason that we often advocate that instead of cutting the tree at 20 inches at the time it is set, cut it 25



FIGURE 28—At left: Five-year-old Wagener apple tree which was summer pruned in July. Photograph taken the following January. Note the amount of after-growth, indicating that the tree was pruned at about the right period. A splendid type of modified leader. At right: Same tree after winter pruning. Note the light amount of wood which has been removed in thinning out; almost no heading back.

or 28 inches, and then space the branches from as near the ground as you can get them up to the top of the trunk. However, if you cut the tree at 25 or 28 inches and then go away and leave it you will often find all the branches will develop near the top of the trunk and the tree will be weak. It is only by careful watching that the extra increase in height of head can be made of any material advantage.

Lesson 2. To Keep Main Branches or Sections of the Tree Properly Dominant.—If one branch tends to grow at

the expense of the rest of the tree the weaker branches gradually become side branches to the two or three remaining stronger branches. If proper pruning is done this can be obviated. We find that the average pruner does one of two things. He may be among the group that cuts the tree level across the top, so he has a plain surface. This will never build a strong, well-balanced tree, because in doing this you pay no attention to the relation of one branch to another. The second group of pruners is apt to cut the weakest wood most and the strongest wood the least. They have heard that the more we cut the wood the more it grows; therefore, if wood is weak and we cut it back it will grow stronger. It is true that the more a tree is pruned back as a whole while dormant the more will be the resulting growth; that heavy heading in of a tree means a heavy after growth. This, however, has to do with the trees as a whole and has little to do with the relation of one branch on a tree to another. If you have a strong branch in close proximity to a weak branch the best way to strengthen the weak branch is by cutting back the strong. The development of the weak branch will be in proportion to its leaf and branch area; if there is a large amount there will be a heavy demand on the sap, and the weak branch will develop. By limiting the branches and leaves on the strong branch you restrict its growth; as a result the following year there will be less discrepancy between the development of the two branches and a continuation of the practice should lead to a balance between the two. The heading back should be done, then, not so much from the point of view of the tree as a whole, but from the point of view of the relation of the branches to each other.



FIGURE 27—At left: Five-year-old Yellow Newtown apple tree which was pruned the previous summer. Note length of shoots which resulted from summer pruning. At right: Same tree as shown at left after winter pruning. Note that the pruning has been light. This tree is reaching the critical period when it should commence to bear. Heavy pruning might keep it from bearing.



FIGURE 29—Balance in pruning. Note at AA equal cutting has resulted in nearly equal strength of branches; at BB unequal cutting has resulted in completely destroying such balance, making a stronger crotch.

Cut the strongest branch the hardest; cut the second branch in vigor not quite so much; the third in vigor still less, until you come to the weakest branch, which should be cut the least. It is only by suppressing the strong branches, limiting the number of leaves and buds that they have, that you can possibly hope to encourage the weaker branches. If you wish to grow a modified tree, or leader-type tree, the only difference we would make in this pruning would be that we should choose one branch for a leader and not cut it back quite so heavily as we should with the open tree, simply letting it have enough of a lead to maintain that position. Other than that we should prune all the branches the same as directed. We can do a great deal of so-called corrective pruning. That is, we may have a tree four or five years old and notice that two of the scaffold branches are weaker than the rest of the tree, consequently we would like to encourage these two branches to grow stronger and larger. To do this, prune these two very lightly and prune the other parts of the tree more heavily, and thus encourage the two weaker branches.

Lesson 3. To Avoid the Sharp-Angled, Equally-Balanced Crotches.—If we examine the average scaffold branch of a tree carefully, from the time it leaves the main trunk up to its last year's growth, we shall observe that it has been developed much along this order. The first year the branch was cut back it forced out a number of laterals. All the laterals except two were removed. These two were cut equally and in most cases were not spaced very far apart. The next year on each one of these two the same treatment was repeated. Two branches were chosen and these were cut equally. The result is that the branches all over the tree are in pairs, of equal strength, and form very sharp forks. Now, this makes a weak branch, one which will break very easily, as the stress and strain all come at very critical points, namely, at the numerous balanced crotches. To avoid this condition of a tree, treat each one of your main branches as a leader. This means that when you choose two branches, at the first you will choose them as far apart as you possibly can, and, second, in pruning these you will cut one harder than the other. Thus one will

become a leader and the other a side branch. If you continue this, the whole branch becomes a strong leader, with a great many side branches, which distribute the strain in such a way as to reduce the breakage to a minimum.

Classes of Non-Bearing Trees

For convenience of discussion, we may divide the young or non-bearing trees into three classes: First, those trees from one to four years of age. This is the formative period, the body-building period of the young tree. Second, the period from four to seven years of age. I have called this the critical age. It is a transition period from the body-building, on the one hand, to the heavy-fruited on the other. With Yellow Newtowns, Baldwins, Winter Nelis, Comice, and many others we could mention, the pruning at this time will determine to a very large degree the fruitfulness of the trees for a number of years to come. The third class or group of trees are those from seven to twelve years of age, which have reached the bearing age, but as yet have not borne a commercial crop. Before taking up the details of pruning these three classes of trees, summer pruning and its relation to such trees may be considered.

Summer Pruning as Adapted to Young Non-Bearing Trees

During the past two years we have heard much about summer pruning, and with many summer pruning has become a fad, and some expect marvelous results. While summer pruning is not new, it is true, however, that it has been more generally used the past few years than formerly, and like everything that is just coming into general practice, is being overdone. Many people are expecting too much from summer pruning.

Let us consider first the summer pruning for our young trees during the formative period, that being the ages from one to four. In many cases not much pruning will be done during the first summer of the tree's life, as the trees often do not make very much growth the first season, but where they do make a vigorous growth and make it by the middle of June or early July it will often be found to advantage to head the trees at that time, cutting them back just about the same way that you would cut them back the following spring. That is, if you have a long terminal growth, 12 to 30 inches in length, cut it back to the point where you desire to force out new laterals for the future body building of the tree. Now, you may have a tree that is running to one or two branches at the expense of all the others. It would be well to pinch back these strong branches so as to hold them back for the time being and thus encourage the weaker branches to grow. By the second year nearly all these trees can be greatly benefited by summer pruning. This may come any time from the latter part of May up to the middle of July, generally about the middle of June. It consists of cutting back the

rank terminal growth so as to force out the laterals and allow them to make a good growth and become hardened before fall. In this way you will gain a whole year in the framework of your trees. A good practice to follow with such trees is to do most of the heading back in June and most of the thinning out in March or April, or whenever the winter pruning is done. However, should the trees after they are pruned in June make such a rank growth that they need some topping back again the following spring, you should by all means do so. In nearly all cases it will be advisable to do some topping back of the terminals, or else the terminal bud will incline to continue this growth, producing a long leggy branch. If no topping is done on these shoots in spring it will be necessary to give them a heavy heading back in summer, to prevent their becoming too long before producing desirable laterals. You should remove from these young trees, during the summer time, any undesirable growth, branches which you know will never be of any value to the tree and are growing at the expense of some branch which should be developed. We would caution, however, against the too strenuous thinning out of young trees. We are of the opinion that we have overdone the thinning out of lateral branches.

This pruning which is given to these young trees, while it does not as a rule directly induce fruitfulness, will tend to bring the trees up to the critical period in much better condition than otherwise, since it tends to balance the tree; and since it distributes the pruning over two periods of the year, it eliminates the necessity for very vigorous pruning which so many growers give trees. The heavy winter pruning given young trees serves as a stimulus and often causes too much vegetative growth.

Some growers are opposed to summer pruning on the grounds that such pruning weakens the tree, that it is devitalizing, that it is unwise to remove any of the leaves as they are the "lungs" and manufacturing organs of the tree. We feel that it would be only in very extreme cases that summer pruning would ever be devitalizing, and certainly not where one makes the single summer pruning as already recommended. Such pruning in some cases might give increased vigor; in others very little difference will be noted; while in still others the growth may be modified to the extent that there is less vegetative growth, but even in the last case there is modification rather than devitalization. The result of a single summer pruning as recommended for these young trees is not so much a question of vigor as it is a question of change in direction of growth or energy. The clipping back of the terminal, forces the growth into desirable new lateral framework rather than into a useless additional terminal growth. There are cases where frequent summer pruning at short in-



FIGURE 30—An example of unequal growth. Branch A is growing at the expense of the other branches in the tree and should be suppressed.

tervals during the summer has a tendency to check or dwarf a tree; for example, in growing dwarf trees we must not only have a dwarfing stock but we must practice frequent pinching back of shoots. Again, we have seen walnut trees dwarfed by removal of all lateral growth for a period of years. These last two cases, however, are extreme and represent excessively frequent pruning. The greatest danger of devitalizing young trees does not come from a single summer pruning, but rather from allowing too heavy bearing of young trees.

We shall now consider summer pruning as related to our second class of trees, namely, those from four to seven years of age. These trees have now gone through their formative period and should have good trunks and scaffold limbs, and should be approaching that period when they can begin to bear heavy crops. We shall modify summer pruning for these trees, as compared with the younger trees. In this case we are to work with the idea of trying to induce fruitfulness

directly if possible. The pruning will generally come considerably later with these older trees. There is no definite time to set. We recommend, however, that the pruning be done at the time the terminal buds are forming on the ends of the shoots. You will note the leaves are beginning to get larger on the ends of the twigs, and if you will look closely you will see that the terminal bud is forming. At that time, which in the Willamette Valley, for example, is generally about the middle of July, we cut back the terminal growth, cutting it back to the point where it is desired to force out new laterals for another year's growth. The cutting at this time seems to cause a thickening of the branches, probably an accumulation of tissues around the buds, and with some varieties, probably, will lead to direct fruiting the following season. With others, however, it will simply tend to keep the trees in balance, and probably encourage earlier fruiting than would otherwise be true. That is, your results may come in two or three years rather than in one year. If this prun-



FIGURE 31—A good example of proper balance between branches. Note that wherever there is a crotch in most cases one branch is stronger than the other. At AA is a bad fork due to even cutting.

ing is done at about the right time very little secondary growth will take place, and what does will naturally be very small. Of course we realize that in many cases these trees four to seven years of age do not harden up until late in September or even in October, and then it would be too late to do any pruning to advantage. Even though summer pruning with these trees might not lead to an increase in fruiting the following summer, it would be a dis-

tinct help in keeping the trees in balance and in eliminating the excessive cutting which might otherwise be necessary the following spring.

We shall consider for just a moment the trees which are from eight to ten or twelve years of age which should be in fruiting, but have never borne. These trees have almost always been over-stimulated. They have been over-pruned, over-tilled, over-irrigated; they have had some one stimulus or a combination of stimuli given them which results in forcing back wood growth, producing heavy large leaves, but little or no fruit. The remedy is to remove the stimulus, whatever it may be, and prune several times a year.

Summer pruning for such trees will come probably more about the time you should prune the very young trees; that is, along in June. At each time when the terminal growth has reached such a length that you can see it is going to become excessive, it should be cut back and the trees thinned out somewhat, and the following spring a little more thinning and pruning out could be done to advantage. The application of summer pruning to these trees

should be largely merely a distribution of the pruning over two periods, thus avoiding an excessive pruning. Only in very rare cases could you expect direct results from such pruning. Results will come indirectly in bringing the trees back to their normal balance. It often becomes necessary to reduce the amount of tillage or irrigation given such trees and in cases where the growth is abnormally excessive it is sometimes found advisable even to check this by growing crops between the trees, such as hay or grain.

Continued in next issue

It is reported that Mr. H. F. Davidson states that the guarantee-fund plan which was instrumental in advancing the price on pears in Yakima Valley, made \$10,000 extra money for the pear growers. Prices on pears were advanced from \$15.00 to \$17.50 per ton; and by the box went from 65 cents to 75 cents to 85 cents. Bartlett pears, which started low at the early part of the season, the latter part of August were reported as selling at \$1.00 per box in various districts throughout the Northwest.

The cherry crop of the Northwest has brought excellent prices this year. Canneries have paid five cents per pound for Royal Annas, or \$100 per ton. One cherry grower in Hood River, J. R. Nunamaker, realized considerably over \$4,000 on four acres of cherries.



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nese garden will be a rare work of art and will hold many surprises for the exposition visitor.

In that portion of the exhibit known as the "Eastern garden" will be found a magnificent exhibition of roses from Rhode Island and Maryland, heliotropes of exquisite color and rich fragrance from New Jersey, and iris and peonies from Pennsylvania. The rose competition has excited international interest. A prize of \$1,000 has been offered by the exposition to the grower producing the finest rose, hitherto unnamed and unexhibited, but which is to be brought forth for the admiration of the world at this exposition. The prize will be awarded by an international jury of award and whatever rose receives the award will be given a name commemorative of the exposition that brought it to fame. Among the renowned rose growers who will have entries in this contest are Hugh Dickson, Belfast, Ireland; Samuel McGredy & Son, Potsdown, Ireland; E. Pernet Ducher, Venissieux-Lyon, France; Dobbie & Son, Edinburgh, Scotland; S. Bide & Son, Farnham, Surrey, England; E. G. Hill, Indiana; Brant-Hentz Flower Company, New Jersey.

In the palace the visitor will find beneath the great dome the exhibit of Cuba, mycrocyclus 1,000 years old, royal palms, giant tree ferns, tropical lilies, bamboo palms, breadfruit and banana trees, mangoes, guanabana, cocoanut trees and date palms in actual bearing. Hawaii, Australia and the Philippines will exhibit tropical displays, from the Philippines coming one bed of 400 varieties of orchids, all different, but blending their wealth of colors in one picturesque expanse of beauty. A feature of Japan's display will be an aquarium of gold fish, giving the typical Oriental finish to the exhibit of rare specimens from that country.

The economic section of the horticultural exhibit will also be housed in the palace, the idea here being to show plant life in its relation to actual life. A model cannery, the combined exhibit of the National Canners' Association,

will find the exhibits of commercial products so arranged as to permit the placing of orders on the spot. And the investor will be able to discover through actual living evidence the productive possibilities of soil from almost every section of the earth.

Every participating state and nation will have part of its display in the outside garden. The Netherlands and the State of Massachusetts will show their exhibits outdoors exclusively. Holland's unified exhibits were presented under the auspices of the National Board of Horticulture and will present the quintessence of floral culture as it is carried on by the famous growers of that country. A flowering mass of 60,000 bulbs is but an item in this gorgeous part of the exposition. Trees which have attained years of growth in their native Dutch soil will be seen here. Rhododendrons, trained conifers and numerous growing botanical specimens will be seen, all set out in a landscape effect arranged by D. T. Tersteeg, of Maarden, Holland, the most noted of the landscape architects of his country. Massachusetts' display will be representative of the state and will be presented by her most noted growers. It will be a Colonial garden designed by Stephen Child, one of the foremost of his profession in the United States. Notable features will be gladioli exhibits by Arthur Cowes, John Lewis Child and B. Hammond Tracy, the most noted gladioli growers in America. There will also be a magnificent assemblage of stately carnations, showing new varieties. The California exhibit will include an extensive showing of Luther Burbank's famous creations. The Japa-

Horticultural Exhibit Panama-Pacific Exposition

[Editorial Bureau, Panama-Pacific International Exposition]

THAT the horticultural exhibit at the Panama-Pacific International Exposition at San Francisco will far surpass in magnitude and general scope all previous exhibitions of the kind held anywhere is the opinion of experts who have examined the exhibit in detail. Fourteen acres will be devoted to horticultural purposes, five of these covered by the Palace of Horticulture, a \$341,000 structure with a great glass dome 152 feet in diameter as the hot-house center, and nine acres of outside garden. The horticultural exhibit, within the palace and without, will include representative displays touching practically every important phase of horticulture as it is carried on in China, Japan, England, Scotland, Ireland, Australia, New Zealand, Canada, The Netherlands, France, Italy, Argentina, Cuba, the Philippines, Hawaii, and the following states of this continent: Oregon, Washington, Utah, Idaho, Montana, Nevada, California, Colorado, Missouri, Kansas, Arkansas, Illinois, Iowa, Indiana, Ohio, Louisiana, New York, Massachusetts, Rhode Island, Pennsylvania, New Jersey, Florida and Maryland.

As a whole the horticultural exhibit of the exposition has been planned with a fivefold purpose: to appeal with equal interest to the tourist, the visitor, the student, the business man and the investor. The tourist will see the pride and the glory of the soil from the other sections of the world. The visitor will be entertained by the beauty and novel wonder of all that is before him. The student will find here an unexampled opportunity to increase his knowledge on all points pertaining to the horticulture of the earth. The business man

Experienced Orchardist and Farmer

with several years' experience in both Hood River and Wenatchee, wishes situation as manager of an orchard or diversified farm. Best of references. Address Otis Tetherow, R-1, Hood River, Oregon.

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HIGH GRADE FRUIT BOXES

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GOOD SERVICE—Write us

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WANTED

a first-class experienced man to take charge of a bearing orchard, Wenatchee District. State experience and wages expected; also give references. Good position for right man. Reply XY, care "Better Fruit," Hood River, Oregon.

BETTER FRUIT

MYERS
HAND SPRAY & POWER
PUMPS

SPRAYING-PAINTING-DISINFECTING

Get your orchards and trees in prime condition this Fall and they will require but little attention next Spring, for Fall spraying with a Myers Spray Pump destroys scale and similar diseases at the right time.

The MYERS POWER SPRAY RIG shown below is built for high pressure work where extensive spraying operations are carried on, and is complete with tank, tower, pump and accessories ready for engine and wagon trucks. Other types of Myers Spray Outfits include small Bucket and Knapsack Sprayers, and medium and large capacity Barrel and Tank Outfits for hand or power operation—All are proven, tested and completely equipped with Nozzles, Hose and Accessories, ready to spray.

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F. E. MYERS & BRO.
ASHLAND PUMP AND HAY TOOL WORKS
120 ORANGE ST. ASHLAND, OHIO.

THE WEIGHT

is given on page 4.

There are also other points of interest to orchardists.

The First National Bank

Hood River, Oregon

Capital and Surplus
\$135,000

**4% Interest Paid on Savings
and Term Deposits**

F. S. STANLEY, President
E. O. BLANCHARD, Cashier

will be shown in operation, conducted by Dr. and Mrs. A. W. Bitting, the most noted technologists in America. The cannery exhibit will demonstrate the various processes involved in fruit canning, from the moment the fruit is received in boxes to the final detail of being crated for delivery to the grocer. There will be a comprehensive exhibit of dried fruits in airtight sanitary packages. An ingenious display of horticultural machinery will be a feature, showing everything up-to-date in the line of appliances and implements. In general the exhibits cover every detail pertaining to the soil, its cultivation and adornment.

Destroy Insects by Fall Plowing

If you want to kill the army worms, cutworms, Hessian flies, grasshoppers and other highly injurious insects plow your fields this fall. Fall plowing, disk and harrowing within the next few weeks will break up the nests, cells and protecting cases of many insects and expose them to the rigors of winter weather. This will completely destroy many of our most injurious insects and greatly diminish the numbers of others. Fall plowing does not affect all insects alike because they pass the winter in the soil in different stages. The grasshoppers and the corn root lice pass the winter in the egg stage; the cutworms, army worms, wire worms and white grubs hibernate in the soil in the worm stage; the fall army worms, corn-ear worms and garden-web worms pass the winter in the pupa or resting stage; and the click beetles, May beetles and potato beetles hibernate in the soil as adult beetles. Many insects are crushed and destroyed in their wintering stages by plowing and disk. Others are brought up nearer the surface, and not being able to go deeper into the soil or to construct new cases are exposed to the ravages of birds and other animals. They are also subjected to excessive cold and moisture, to alternate freezing and thawing, and are killed. Old wheat stubble fields full of volunteer wheat, weeds and grass are now harboring Hessian flies, army worms, cutworms, grasshopper eggs and plant lice, all of which may be destroyed by fall plowing. If these old stubble fields are not plowed until next spring serious injury may occur to corn, wheat and other crops in the neighborhood. The Hessian flies coming from the volunteer wheat next spring may completely destroy late-sown wheat.—T. J. Talbert, University of Missouri, College of Agriculture.

How to Make Vinegar

The housewife, either on the farm or in the city, who makes her own vinegar may be assured of both its purity and strength if she follows certain specific directions, according to Miss Carrie Pancoast of the Missouri College of Agriculture. Good vinegar can be prepared from cider. Fill a barrel or cask half or two-thirds full. A considerable surface of the liquid must be exposed

to the air. For this purpose, bore two-inch holes in opposite sides of the barrel—one near the surface of the liquid and one near the top of the barrel. Cover the holes with wire netting to prevent the entrance of flies. One of three methods may be pursued in the formation of vinegar from the cider—(1) allow the cider to stand until souring occurs; (2) add a little vinegar of good quality, or (3) hasten the process by the addition of the "mother of vinegar," a portion of the film which has developed on the surface of vinegar previously prepared. Part of the vinegar may be drawn off and the loss made good with fresh cider, using care not to break the film. The added cider will rapidly be converted into vinegar, and the process may be repeated in three or four weeks. When drawn off, the vinegar should be strained and placed in tightly-stoppered vessels—otherwise it will lose its strength.—University of Missouri.

The Pacific International Live Stock Exposition will be held in Portland at the Union Stock Yards, North Portland, December 6-11. As many fruitgrowers are going extensively into the dairy business, hogs and sheep as side lines, this exposition, which is one of the finest held in the Northwest, or anywhere else in the United States for that matter, will give every visitor wonderful opportunities to learn about stock, the care of stock, and the kind of stock that pays to raise. No fruitgrower who is raising stock or expecting to should fail to attend this show.

The Oregon Nursery Company, Orenco, Oregon, one of the largest and most progressive nurseries in the Northwest, has added a landscape gardening department, having secured the services of a specialist, Mr. H. E. Burdette, who is a practical man in this line of work, for the purpose of assisting all patrons of this company to enable them to lay out their gardens, lawns, etc., around their homes in the most attractive manner possible.

PORTLAND WHOLESALE NURSERY COMPANY

Rooms 6 & 7, 122½ Grand Ave., Portland, Oregon

Wholesalers of Nursery Stock and Nursery Supplies
A very complete line of
Fruit and Ornamental Trees, Shrubs, Vines, Etc.
SPECIALTIES
Clean Coast Grown Seedlings
Oregon Champion Gooseberries and
Write Now Perfection Currants Write Now

Caught 51 Rats One Week

Trap resets itself; 22 inches high; will last for years; can't get out of order; weighs 7 pounds. Cheese is used, doing away with poisons. This trap does its work, never fails and is always ready for the next rat. When rats and mice pass device they die. Rats are disease carriers, also cause fires. Rat catcher sent prepaid on receipt of \$3.00; Mouse catcher, 10 inches high, \$1.00. Money back if not satisfied. One of these rat catchers should be in every school building.

H. D. SWARTS, INVENTOR AND MANUFACTURER

Universal Rat and Mouse Trap

Box 566

SCRANTON, PA.

Planting Narcissus, Daffodil and Tulip Bulbs for Next Spring

There is nothing that will beautify a lawn quite so much as a bed of tulips, daffodils and narcissus blooming in the early spring. The beds should be prepared in the fall. As a general rule bulbs should be planted in October and November, so that the roots may make a good growth before cold weather sets in. Bulbs require a moderately rich soil that is well drained. Narcissus and daffodil bulbs should be set about ten inches apart and five inches deep, and tulip bulbs should be set five inches apart and four inches deep, but this will depend largely on the size of the bulb. A good rule to go by is to cover the bulbs with soil one and one-half times their depth. When the ground freezes it is a good idea to cover the beds with a light mulch of straw or leaves, which should be removed early in the spring. After blossoming in the spring allow from six to ten weeks for the foliage to die, when the bulbs can be taken up. Shake the soil from the roots and put them in a cool place where they will ripen, until time for planting in the fall. If bulbs are wanted

for house culture the soil should be light and rich, one-third good soil, one-third sand and one-third thoroughly rotted manure, and the bulbs planted thickly, so they almost touch. As soon as planted they should be well watered and put away in a cool dry place. If the room is light they should be covered to keep them dark. If the soil gets dry water them, but not oftener than every two weeks. Bring them out after about four to six weeks, when they should be watered freely. A very good idea, if one has several pots of bulbs, is to bring them out about two weeks apart, and in this way a succession of flowers can be had all winter and spring.

The North Pacific Fruit Distributors through their manager, J. H. Robbins, state that they will control about the same percentage of tonnage this year as last year. J. H. Robbins, manager, attended the International Apple Shippers' convention at Chicago and reported the apple crop of the United States much less than last year—approximately about 50 per cent.

Mr. Wilmer Sieg, sales manager of the Hood River Apple Growers' Association, attended the International Apple Shippers' Association meeting held in Chicago in August, reporting the apple situation as much more favorable in the way of prices this year. In fact Mr. Sieg is optimistic about obtaining reasonably good prices this year.

B. A. Perham, sales manager of the North Pacific Fruit Distributors, reported in August that the peach crop would amount to 1,200 carloads, and it is also his opinion that the crop will be marketed west of Kansas City and Minneapolis.

Mr. John Steel of Parma, Idaho, who is one of the largest prune orchardists in that state, owning about forty acres in prunes and sixty acres in apples, has signed up his crop with the North Pacific Fruit Distributors.

Mr. L. J. Blot, formerly of the North Pacific Fruit Distributors, is sales manager of the Spokane Fruit Growers Co., a man credited with having splendid salesman ability and an extensive acquaintance with the trade.

The strawberry weevil pest is reported as doing extensive damage to the strawberry patches around Kennewick.

Loganberry juice has been given a great boost through the praise awarded it by William Jennings Bryan.

The pear crop of all of the Eastern States is reported much less than last year.

Rats.

H. D. Swarts, of Scranton, Pa., has invented a rat catcher that caught over 100 rats in a month in one establishment. See his ad. in this issue.—Adv.

FALL SOWING

Tested Vetch, Clover, Timothy and Grass Cover Crops—Sold by Dealers
Send for Price List.
The Chas. H. Lilly Co.
Seattle, Wash.
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SEEDS**

Mr. Shipper:

**Cold
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—your APPLES with us in LOS ANGELES and feed out to the consuming public as market demands and PRICES SUIT.

LOS ANGELES is the distributing center of the great Southwest.

California apple crop 1,800 cars short this season.

Big Market for your Apples.

We operate the largest and best equipped Cold Storage warehouses on the Pacific Coast.

DIRECT RAILROAD CONNECTIONS — RATES REASONABLE.

We shall appreciate your business and will show our appreciation by the high quality of service we render you.

If we can be of service to you in furnishing data on market conditions, feel free to call on us and it will be our pleasure to serve you.

**Los Angeles Ice and
Cold Storage Co.**

P.O. Box 643, Station C

**Los Angeles
California**

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Official Organ of The Northwest Fruit Growers' Association
A Monthly Illustrated Magazine Published in the
Interest of Modern Fruit Growing and Marketing
All Communications Should Be Addressed and Remittances
Made Payable to

Better Fruit Publishing Company

E. H. SHEPARD, Editor and Publisher

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ADVERTISING RATES ON APPLICATION

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Postoffice at Hood River, Oregon, under Act
of Congress of March 3, 1879.

Over Production.—About six or seven years ago, at one of the National Apple shows, in an address made by one of the railroad presidents, he stated that in the year 1915 the Northwest would ship 50,000 carloads of apples and in the year 1920 150,000 carloads of apples. A short time afterwards, Better Fruit editorially stated that it did not believe the apple shipments in 1915 would exceed 15,000 carloads, to any great extent. The year 1915 has arrived and nearly gone. The apple tonnage of the four Northwestern states will be in the neighborhood of 7000 cars and some estimate as low as 6000. Last year the shipments were somewhere between 12,000 and 13,000 cars. Had this year produced a normal crop instead of about 60 to 70 per cent, on account of the increased age of the trees the tonnage would have been somewhere around the neighborhood of 15,000 cars and in all probability would not have exceeded that amount very greatly. The Northwest, on an average, has not increased in tonnage probably more than 20 to 25 per cent over any previous normal year which was not exceedingly heavy or unusually light. If this rate of increase should be continued and maintained, it would mean that in the year 1920 the Northwest would probably ship about 30,000 carloads. However, it is possible and even probable that the increased planting during the years 1910 and 1911 will increase the tonnage beyond the estimated 25 per cent per year, and it is possible that the Northwest in the year 1920 may ship somewhere between 30,000 and 50,000 carloads, which is a long ways from 150,000 carloads, as prophesied by a prominent speaker at the National Apple Show a few years ago. It must be evident to a man who

is familiar with the tonnage and the Northwest conditions, that the enormous over production is not the bugbear that a good many prophesied it would be a few years ago. When the slump first came in 1912, apple plantings stopped. Consequently there has been no setting of trees since that time. In the year 1920 all of the trees set in the Northwest will be eight years of age, when they reach a fair bearing capacity. After that time, therefore, it is doubtful if there will be any material increase in the tonnage of apples in the Northwest for some years to come.

Marketing Wormy Apples.—The codling moth was more severe in the Northwest in its ravages this year than for many years in the past. In various districts the damage done in the way of stings and worm holes has been estimated in many orchards as varying from 10 to 75 per cent. Of course there are a number of orchardists who have been extremely successful, who have sprayed so thoroughly and so well that their damage is less than 2 per cent. In some districts, special arrangements have been made for marketing fruit damaged by the codling moth, the authorities feeling that on account of the short crop, there would be an opportunity to dispose of this fruit, helping out the grower and accommodating the public by supplying this grade at a moderate price. Consequently arrangements have been effected by which fruit affected by codling moth can be shipped in vegetable crates, unwrapped, making it evident that there is no misrepresentation. Of course where the quantity of fruit affected by codling moth is large in the district, it is only natural that growers should want to realize in some way if possible. It is to be regretted that such a condition exists. The districts which have only a small quantity affected in this way are indeed fortunate, because they can well afford then to send this grade to the vinegar factory. One observation in conclusion seems important, and that is, this fruit should be marketed with good judgment and kept out of our best consuming markets that handle our extra fancy and fancy grades of fruit, for which they are willing to pay a satisfactory price. The Northwest must keep up its standard of quality to the fullest possible extent.

Advertising the Apple to Increase Consumption.—Every man connected with the marketing of apples appreciates fully the importance of advertising to create a demand. In fact, a great many growers also realize the importance of an extensive publicity campaign. The trouble seems to be, however, this year in raising a sufficient fund. The apple growers were short on account of low prices last year, and although the price looked good for this present season, the average apple grower considers himself wise, and is not going to spend any money before he gets it. Under these circumstances, it was difficult to raise the fund necessary for the right kind of an advertis-

ing campaign, but with the value of advertising made evident to the fruit grower, with good prices and good returns this year, there is little doubt but what the growers in the different districts will come cheerfully forward next year with enough per box, through the associations through which they ship, to put on a campaign that will increase the consumption of apples and create an increased demand, just the same as the demand has been created and the consumption increased by the orange growers in Southern California and all the different food product manufacturers of America, like Cream of Wheat, Toasted Corn Flakes, Sunny Jim, etc.

Walnut Growing.—The success of the early pioneers in the English walnut industry, originally in the Willamette Valley, was so marked that a great many walnut groves have been set during the last few years, which have very recently come into bearing and are fulfilling in every way the expectations of the planters, who are producing good crops of superior quality which are selling at a good price. The Franquette walnut seems to be the favorite. The Mayette is another variety favored also. The Franquette is one of the best flavored walnuts that the editor has ever tasted. Last year he was presented with ten pounds, and unhesitatingly pronounces it the best flavored walnuts he had yet tasted. There are a great many walnut groves in the Willamette Valley which are producing quite extensively, a ready market being found for all that is produced. Recently considerable attention has been given the walnut industry in the Yakima Valley, and upon investigation, Mr. Wiggins of the Washington Nursery, has found a grove which is over thirty years old, in fine condition, the nuts being large and of excellent quality. It is quite evident from the success of this grove and odd trees planted here and there, that the climate and soil of the Yakima Valley is suited for the tender walnuts such as mentioned above. The walnut growers of the Northwest are showing their interest in the development of the industry, holding a meeting in Portland, during the first week of November.

The Value of Our Association Salesmen.—Too frequently we hear the remark: "I can sell apples just as well as anybody else." Perhaps you can; but in order to be a good salesman or sales manager, one must not only be familiar with all of the different varieties and grades, their eating qualities, their cooking qualities, and their keeping qualities, but he must possess a knowledge of crop condition in all of the various districts and above all, he should possess an extensive acquaintanceship with the dealers who are our purchasers. Very few individual growers possess such qualifications. Anybody can sell apples. Yes, but it takes a salesman to realize the market value of our apples, and the market value is all that any one can expect.

By-Products.—The By-Product Committee has not accomplished as much as was anticipated, for which there seems to be a very good reason. After considerable investigation on the part of the By-Product Committee, it wisely arrived at the conclusion that the whole success of the fruit industry did not depend entirely on by-products or primarily upon by-products, but that the future of the fruit industry must depend, first, upon the satisfactory distribution and sales of fresh fruit, and therefore most of the members of the By-Product Committee realized the necessity of assisting to create a market for fresh fruits, giving most of their

The Power

is given on page 4.

There are also other points of interest to orchardists.

W. van Diem

Lange Franken Straat 45, 47, 49, 51, 61
ROTTERDAM, HOLLAND

European Receivers of American Fruits
Eldest and First-Class House in this Branch
Cable Address: W. Vandiem A B C Code used; 5th Edition
Our Specialties are

Apples, Pears, Navel Oranges

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Commercial Sale Room, Deansgate,
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Consignments and Correspondence Solicited

attention and time to that subject. Much has been done along this line by the By-Product Committee, it being instrumental in calling together the Growers' Council. As this influence has already produced good results, it seems timely that the attention of the By-Product Committee should again be called to the subject of by-products. Every year there will be a large amount of all varieties of fruits which for various reasons cannot be marketed as fresh. In the apple business in particular very many apples are either affected by worm stings, fungus, bruises or otherwise below grade, so they are not saleable as fresh fruit. The value of such ranges anywhere from \$6.00 to \$10.00 per ton. In the aggregate this is quite a large sum to the fruit grower, particularly the one who has a large-sized tract. As an instance, a fruit grower who has a full-bearing orchard with a reasonably clean crop will realize from the vinegar factory about \$9.00 per acre this year. A man with forty acres will average for the by-product factory from one to two tons per acre, which at the low figure of \$6.00 per ton would bring from \$6.00 to \$12.00 per acre. This would mean to the apple grower who had forty acres from \$240.00 to \$480.00; \$480.00 will pay the grocery and meat bills for the average family for a year. With a good by-product factory this means just so much money saved because the fruit grower has to pay out this amount and even more to pick, haul and grade out the stuff that is unshippable, and by disposing of it to the vinegar factory he has the opportunity of getting back his money, and \$480.00 saved in this way is just as good as \$480.00 made in any other way.

South America as an Apple Market.—So many reports have appeared in print about the opportunities existing in South America as an apple market, that it seems worth while for the apple shipping concerns of the Northwest to give South American business their earnest attention. The government recently sent a man to South America for the benefit of the apple growers of America. This man lived there, speaking Spanish. Before going this gentleman visited the editor at his office in Hood River, explaining the situation quite fully in advance. Without doubt South America will take an immense quantity of our fruit, but before this can be done, necessary arrangements will have to be made both in the way of transportation, financing details, and proper connections. But the opportunity is so great that it should have special investigation by the apple growers through their shipping concerns.

Manufacturers' and Land Products Show.—The editor visited the Land Products Show when in Portland last week, and pronounces it the best show that Portland has ever held of this class. The displays of diversified farm products made by the different counties were among the most attractive, interesting and beneficial features of

HERE ARE THE

Cut Prices

—ON—

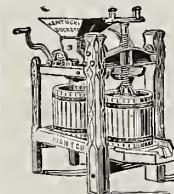
Fruit Ladders

6-ft. Mitchell Tri-Pod Ladder	\$2.40
8-ft. Mitchell Tri-Pod Ladder	3.20
10-ft. Mitchell Tri-Pod Ladder	4.00
12-ft. Mitchell Tri-Pod Ladder	4.80
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At these prices (for a first-class ladder) you simply cannot afford NOT to send us a money order or check for one of these ladders

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Mitchell-Keystone Cider Mill



and you will get more for your money.

Three Sizes
Prices upon request.

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LEWIS & STAYER CO.

Portland, Ore.
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Boise, Idaho

the entire show. The exhibit of manufactured goods "made in the Northwest" also commanded the attention of the visitor in a very forcible way. The exhibit of home-made manufactured goods will be a strong factor in educating the public as to what is manufactured at home, and with continued effort along this line, a large increase in business can be developed for home manufacturers, which will contribute to the prosperity of the Northwest. The apple exhibits were not large. However, The Dalles had an excellent display of fifty boxes, and Hood River about thirty boxes, consisting of Spitzembergs and Newtowns. One display, made by Gus Miller, of fifteen boxes of Newtowns, was especially attractive. It is to be sincerely regretted that the apple growers did not take greater interest in the show and make more extensive exhibits. However, the apple grower himself understands pretty well

Oregon Nursery Company

ORENCO, OREGON

Extensive growers of all lines of Fruit, Nut and Shade Trees, Evergreens, Flowering Shrubs, Vines, Roses, etc. Introducers of the VROOMAN FRANQUETTE walnut, recognized as the best walnut. Our large complete stock consists of varieties suitable for every kind of climate.

Write us about your wants before buying.

Increase your crop—preserve the vigor of your trees by Fall spraying

Remember scale is softer, less resistant and easier to kill it the Fall.

Scale hardens and saps the vitality of your trees during the Winter months, making the tree less vigorous, the scale more resistant.

Write for prices on Lime Sulphur Bordeaux Mixture, Scalecide

Free Spray Booklet and our Annual Autumn Catalog of Trees and Nursery Stock and Supplies now ready. Ask for Catalog No. 201.

Don't Neglect Fall Spraying!

Portland Seed Co.
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OUR PRODUCTS ARE OF SUPERIOR QUALITY
AND GUARANTEED TO GIVE SATISFACTION.

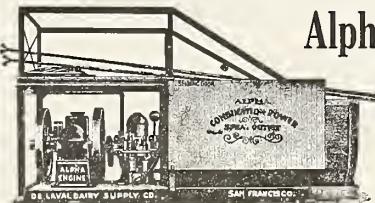
PRICE and QUALITY always right.

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A. C. RULOFSON CO.

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the reasons; the fact of the matter being that last year pries were so low that the grower did well to make his expenses, many growers not even doing this. Consequently, they have been short of funds and will be up to the time they receive money for this year's crop. The weather being beautiful, every fruit grower was busily engaged in harvesting his crop, putting forth every effort to finish before the rains set in. For these reasons he felt unable to make exhibits on account of lack of funds and did not feel inclined to delay his harvesting in preparing exhibits. This was the condition this year, but it

is to be hoped that next year conditions will change so that the apple grower will take more interest in making exhibits. These are opportunities they should not miss, as this kind of publicity is the best kind of advertising at the lowest cost, which the fruit grower can avail himself of. The show was particularly attractive on account of it being high class in every respect. Every exhibit was one of merit.

The Growers' Council.—While a great many people are unreasonable in their expectations in reference to the Growers' Council, it seems apparent to

the writer that the Growers' Council has accomplished a wonderful amount of good by creating a splendid influence. Some people expected the Fruit Growers' Council to have the power to dictate and set prices. Such expectations were unjustified and unreasonable. No organization can set or fix prices without being a trust and absolutely controlling the situation. If any shipping concern or combination of shipping concerns had a sufficient control of the situation and the tonnage to fix prices by dictation, such a condition might be construed as a violation of the trust laws. But to return to the subject—the Growers' Council succeeded in calling a number of prominent growers together from all over, in two large meetings, one in Seattle and one in Tacoma, and also succeeded in getting representatives, officials, salesmen and attorneys of the various shipping concerns together for a conference. In these meetings a great many things were threshed out. All the different shipping concerns found out that the others had some mighty good men, and every one present concluded that the other fellow was not entirely to blame for the disastrous condition that had prevailed. The result of these meetings has been a better feeling of the shipping concerns, which has resulted in a more harmonious condition and less unnecessary competition. This has been a big factor in assisting the selling concerns to obtain more satisfactory pries for the apple growers in the season of 1915.

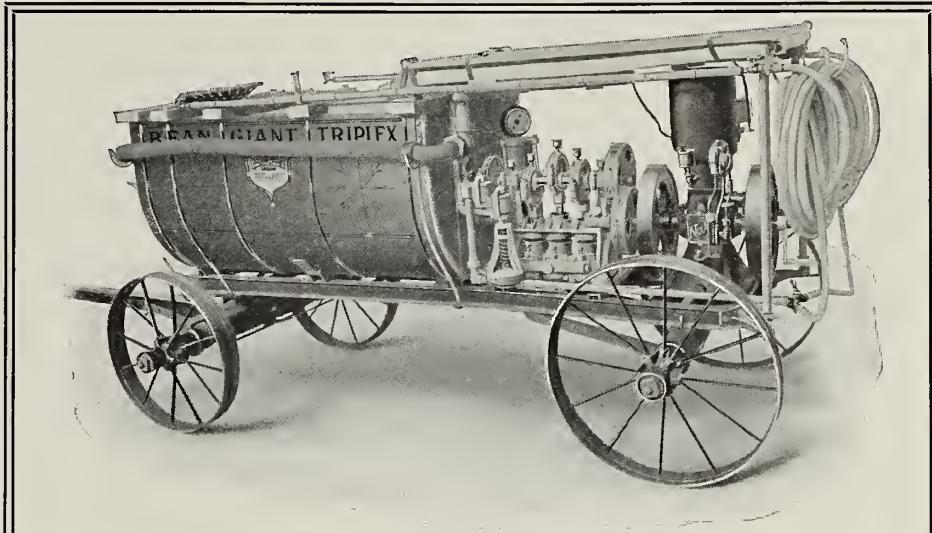
The 1915 Apple Movement.—The local jobbing and trade centers of the Northwest, like Portland, Seattle, Spokane and Tacoma, at the present time are pretty well filled up with apples of the fall varieties and the very early winter varieties, also low grades. Practically all of the apples that are not in first-class keeping condition are being rushed on to the market very rapidly, especially by those districts which have no cold storage facilities. Consequently the market is pretty well filled up with low-grade fruit, very little of the extra fancy and fancy winter varieties being in evidence. Due to the unusual amount of apples affected by codling moth this year and the prevalence of scab in some districts, both of which would affect the value of apples, much of this kind of fruit is being turned loose on the market for the reason that they do not justify cold storage expense.

Stampede Among Fruit Growers.—The fruit industry of the Northwest has certainly gone through a very wonderful and interesting development and evolution. In this development attention is called to the marked stampede among fruit growers, first in one direction, then in another. A few years ago apple growers of the Northwest concentrated all their efforts in an earnest endeavor to produce quality fruit, doing their work well and thoroughly. In fact, they spared no expense, and it might be said they did their work

expensively, without any idea of the necessity for economy. Much money was wasted. During the last two or three years the whole stampede has been toward selling fruit, consequently there has been a lack of sufficient attention to proper producing methods. A great many growers in this last stampede felt that apples would not bring much money this year. Many growers have slipped a cog in their productive methods, which in a large measure is lack of attention. The fruit growers have lost more through codling moth damage and fungus this year than they have for many years. All of which is intended to indicate the fruit grower should devote sufficient time to producing first, clean fruit, and secondly, to devote a sufficient amount of time to the marketing problem to progress in that as well.

Apples in Local Jobbing Centers of the Northwest.—There are four principal consuming, jobbing, and supply centers in the Northwest—Seattle, Spokane, Tacoma and Portland. It has been suggested that these cities should patronize to the fullest possible extent the associations and growers in their respective states. Such a claim is perfectly justified. The growers in Washington are justified in expecting the fullest cooperation from the fruit dealers of Seattle, Tacoma and Spokane, provided of course they, the growers, cooperate in return. The growers in Oregon are justified in expecting that Portland should favor Oregon growers, provided Portland fruit dealers receive proper treatment. There is no reason in the world why the fruit-jobbing concerns in each state should not give hearty support to the fruit dealers in their own state. Not one of the cities above mentioned has consumed the amount of apples that can be marketed. This is an un-worked problem, but it is a problem that certainly is capable of solution. Our dealers in these cities should be cooperated with to the fullest extent by the shipping concerns, with a view to creating the greatest consumption possible in nearby markets, because there is no better market for the producer than the nearby market, when properly handled. The editor calls particular attention to this suggestion, feeling that there is ample ability in every one of the selling organizations to assist in working out this problem so that the increased consumption and sale in our Northwestern cities that growers are entitled to can be realized. It is to be hoped that it will be done. The editor believes it can be done.

Harmony Among the Shipping Concerns.—During a few years previous to 1915 a great deal of bitterness existed between the different shipping organizations, resulting in a great deal of criticism, one association or shipping concern blaming another for demoralizing competition. In their endeavor for tonnage, unnecessary campaign methods were used, which reflected, more or less, in many instances unnecessarily on other shipping concerns. It



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was with some satisfaction therefore that it is to be noted so far this year there is far greater harmony prevailing among the shipping concerns than has existed for several years in the past. In fact, if there is any severe criticism on the part of one concern in reference to another, so far it has not been made public.

European Apple Shipments.—The European apple shipments for the week ending October 23, according to Mahlon Terhune, freight broker and forwarding agent, New York City, were a little less than half the shipments for the corresponding week of last year. It must be remembered, however, that the

shipment of box apples from the Northwest last year was about three times what it was in previous years. Freight and insurance rates are much higher this year, and therefore European shipments will probably be considerably less. However, owing to the short crop in the United States the export markets will not be needed to the extent they are during a year of heavy production.

The consumption of apples can be stimulated if all of the local papers and the big dailies in the cities will publish a few of the excellent recipes that have been published at various times. The O.-W. R. & N. Ry. last year issued a very valuable booklet on "Fifty Ways

I have been to the Expositions and I want to tell you that every man, woman & child who can, by any means, should go. Children of to-day may again enjoy such an opportunity, but you and I—in the prime of life—never.

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of Serving the Apple as Dessert." The Northern Pacific Railway issued a very attractive booklet called "Apple Talk," containing a number of very valuable recipes. Apples can be served as dessert in ways too numerous to mention, and what is equally if not more important, is the fact that there is no more wholesome and healthful dessert than one made from apples, and none that costs less.

Wilt the Apple Market Advance?—This apparently is a year for reasonably good prices all the way through; First, on account of the short apple crop; second, on account of improved business conditions; third, better marketing facilities. However, the sellers should bear in mind that it is not wise to take the last drop of milk from the cocoanut. They should remember that there is another year ahead of us, and with their own interests in view, they should not be slow in realizing the necessity of making the price to the dealers sufficiently reasonable so he can make a fair profit.

National Apple Day, October 19.—National Apple Day was celebrated quite universally throughout the United States, and was a great feature in stimulating the consumption of apples early in the season, which is always desirable for the fruit grower and beneficial to the consumer. National Apple Day was originated by Mr. James Handley of Quincy, Illinois. An interesting

article will be found in the October edition of Better Fruit of the life of Mr. Handley and the history of the origin of National Apple Day.

Grading Apples in 1915.—From the reports, a number of apple-producing districts are using extreme care and a thoroughness in their inspection this year. Generally speaking the inspectors are meeting with a hearty cooperation from the growers, who as a rule seem anxious and willing to put up a pack that shall meet grade requirements in every particular. Nothing better can be done for the future of the Northwest apple industry than to put up an honest grade.

Extra Fancy Apples.—The supply of extra fancies in the Northwest is comparatively much less than last year, due to codling moth being worse this year than for many years in the past. Fungus has also affected quite a large quantity. Slight defects like fungus spots do not affect the quality of the apples, but they are not permitted in the extra fancy grade.

The Rural Spirit of Portland, Oregon, is very fortunate, having secured the services of Mr. I. D. Graham as editor. The stock industry of the Northwest has increased very rapidly during the past few years, as illustrated by the fact a few years ago the Union Meat Company of Portland imported 90 per cent of the hogs they slaughtered

from the Middle West, whereas during the past year 90 per cent of the hogs they slaughtered were produced in the Northwest. The stock industry is becoming so important in the Northwest that the Rural Spirit decided to engage the most able man they could secure in this line of work, deciding on Mr. Graham, who is familiar to many of the readers of such publications as the Breeders' Gazette. Mr. Graham is considered a very high authority on live stock and very thoroughly informed on all subjects pertaining to raising stock, feeding stock and caring for stock, and other matters pertaining to the stock industry. His connection with the Rural Spirit will add much to its value, which will be of interest to the fruit-growers, inasmuch as many fruit-growers are going quite extensively into the dairying business and hog raising.

Rogue River reports an unusually light crop of apples this year, probably somewhere between 100 and 200 car-loads, due principally to two causes—drought and frost.

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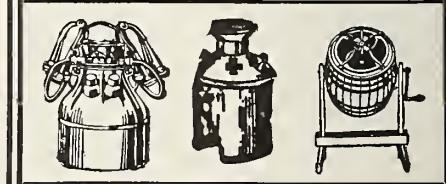
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Some Results of the Apple Storage Investigation by U. S.

E. L. Markell, United States Department of Agriculture, Washington, D. C.

THE problem of fruit storage would be much simplified if the theory held by one of the darkeys working in the government precooling plant in Florida were correct. "What's all dis here machinery, Sam?" one of his friends asked him. "Why, dat's de guver'ment embalming plant," was the answer. "You puts de oranges in dere an' dey keeps forever." Unfortunately storage of every type has its limitations, and so far no fruit has been discovered which keeps forever. Exceptional instances do occur—one is continually meeting the grower who overlooked one box of apples in the storage house and found four-fifths of them in good condition the following August, and the other grower, some of whose Jonathans

kept perfectly in his cellar until June. Such exceptions are interesting, but they merely serve to emphasize the fact that what the practical grower is concerned with is the rule of the average, the normal result in the greatest possible number of cases of fruit storage on a commercial scale. It is to determine the normal average results of storage from the behavior of apples of the chief commercial varieties grown in the Northwest, picked and stored under different conditions, that the Department of Agriculture has been conducting these experiments for the past four years.

The apple is an organism, and like every living thing has a definite length of life. Favorable or unfavorable con-

ditions may increase or decrease the normal existence of the apple, exactly as they influence other forms of living organic matter. Centenarians among men have their counterparts in centenarians among apples, but these exceptions do not prove that all apples are capable of such prolonged existence. To secure the maximum length of life for his fruit the grower must determine the conditions most favorable for its preservation.

During its growing period, the apple stores within itself food material that is capable of preserving its life for a considerable length of time after its removal from the tree. These food products are mainly starches and sugars, and by the chemical changes which occur in the apple during the ripening process the starches are changed into sugars, and the sugars gradually break up into simpler compounds. The object of storage is to postpone the final breakdown or death of the fruit by checking these developing processes. Thus the fruit secures the maximum length of life as well as full development.

Much, however, depends upon the fruit itself. The condition of the fruit at the time of picking is a controlling factor. It is a common fallacy to imagine that the greener the apple the better its chances of keeping. A green apple is usually immature and the food stored within it has not reached the stage at which it can be utilized by the fruit after it is picked. In consequence green apples fail to become mellow, but shrivel, while the flesh remains hard and insipid. Immature fruit is also found to be more susceptible to diseases. The skin in particular is more subject to scald than that of mature fruit of the same variety. The final death of fruit picked while immature comes more quickly than in the case of that picked at maturity. The work of the Department of Agriculture has clearly demonstrated the importance of picking the fruit at the proper stage. The most striking example of the effect of the degree of maturity at picking time on the keeping quality of the fruit is brought out in the case of Rome Beauty apple, which the following table illustrates:

ROME BEAUTY.

MATURE VS. IMMATURE FRUIT.

Per cent bad scald and decay at withdrawal from storage, and after a holding period of ten days under market conditions. Three-year average. Time in storage at first withdrawal, none to three and one-half months.

	BAD SCALD At withdrawal	DECAY At withdrawal	BAD SCALD At 10 days later	DECAY At 10 days later
First withdrawal:				
Mature	0.0	2.1	0.0	0.3
Immature	0.0	65.3	0.0	0.6
Second withdrawal:				
Mature	0.0	6.6	0.0	0.3
Immature	26.5	79.5	0.0	0.0
Third withdrawal:				
Mature	1.4	10.6	0.0	1.0
Immature	62.0	93.1	0.3	12.9
Fourth withdrawal:				
Mature	4.3	18.7	0.0	3.6
Immature	72.6	89.6	0.4	23.7

The table shows the results at four withdrawals from storage in January,

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The most serious pests and diseases doing the most damage to trees in the Northwest are San Jose Scale and Anthracnose. The ones doing the most damage to crops and causing a loss of millions annually to fruit growers, are Codling Moth and Scab.

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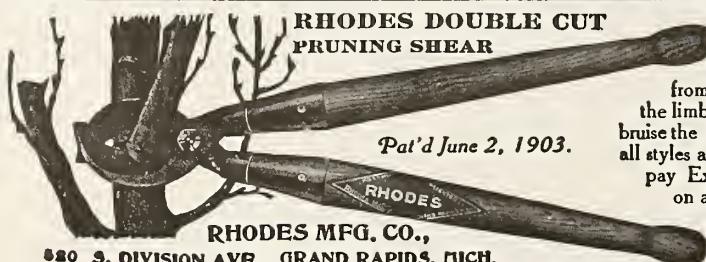
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the middle of February, late March and May. At the first withdrawal no scald showed up, either in the mature or the immature fruit. It was then held under ordinary market conditions, and at the end of ten days only 2.1% of the mature fruit had developed scald, in striking contrast to which is the 65.3% of scald in the immature fruit. At the second withdrawal the mature fruit was still free from scald, but 26.5%, or more than a quarter of the immature lots, had developed scald before removal. Ten days after the last withdrawal 18.7% of the mature fruit showed scald, in contrast to 89.6% of the immature fruit—less than one-fifth of each box in the one case, against almost nine-tenths in the other. Such differences speak for themselves. Ten days after the last lots of fruit had been removed from storage, the decay in the mature lot amounted to 3.6%, but the decay in the lot picked before maturity reached 23.7%.

A greater amount of scald shows up than commonly occurs with other varieties, but Rome Beauty is notoriously susceptible to scald. The natural inference to be drawn from the large amount of scald developing in the picks made before maturity is that in immature fruit the cells forming the skin are weak and break down in storage. After removal from storage they break down still further, and permit the entrance of fungus spores, resulting in more serious decay, as the figures indicate.

The dates at which the apples in the above table were picked are omitted to avoid confusion. Differences of season, section, culture and soil render it absolutely impossible to give a definite statement regarding commercial picking dates for a variety. Many points should be considered in determining whether a variety is ready for picking. In general the seeds should be brown, the apple should have a good color for the variety, the ground color should be white or creamy white, but not yellow, and the fruit should snap readily from the spurs. The proper time for picking is an individual problem for each locality and season, and the grower must determine it for himself.

The tendency in some localities of the Northwest has been to pick prematurely, while in other sections the opposite tendency is prevalent. It should be thoroughly understood that over-maturity is fully as detrimental to the keeping quality of fruit as immaturity. Apples that are over-mature at the time of picking have effected an almost complete change of the starches into sugar, and are that much nearer the end of their life. They could not be expected to last as long as fruit picked a week or two earlier and placed at a temperature that would greatly reduce the speed of the chemical changes occurring in it. The competition among the growers for high color in such varieties as Jonathan and Esopus (Spitzenberg) has often been carried on at the expense of their keep-

ing qualities. The results secured with Esopus (Spitzenberg) last year are illustrative of the effects of this practice.

ESOPUS (SPITZENBERG)
EFFECT OF OVERMATURITY.

Per cent physiological and fungus decay at withdrawal from storage, and after a ten-day holding period under market conditions. The first pick was made September 25, stored September 26, 1913. The second pick was made October 10, and stored October 11, 1913.

DECAY

<i>First withdrawal,</i> <i>January 12, 1914:</i>	<i>At with- drawal</i>	<i>10 days later</i>
First pick	0.0	1.3
Second pick	2.3	2.3
<i>Second withdrawal, February 19, 1914:</i>		
First pick	0.0	1.3
Second pick	9.1	25.0
<i>Third withdrawal, April 1, 1914:</i>		
First pick	1.3	2.7
Second pick	4.0	26.0
<i>Fourth withdrawal, May 4, 1914:</i>		
First pick	2.7	6.7
Second pick	14.0	36.0

As can be seen, at the first inspection the difference in the two picks are very slight, but little decay occurring in either. At the second inspection, on February 19, which marks the usual limit of commercial storage for this variety, there was no decay in the first pick, made at maturity, and 9.1% in the second. Ten days later, or by the time the fruit would normally reach the consumer, the decay had increased to 25% (one-fourth of each box) in the lot picked when over-mature, and was only 1.3% in the lot picked at maturity. Considering the fact that the first pick was made before commercial picking for that variety could be said to have strated in that particular section, and the last pick was made considerably before the last commercial pickings, it is interesting to speculate how much of the Esopus (Spitzenberg) from this locality was fit to use when it reached the consumers.

The temperature at the time of picking is a very important factor in determining the length of life of the fruit. If the temperature is high at the picking time, the fruit matures very rapidly. This was the case during the past season. An uncommonly mild fall has

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caused the apples in many sections to mature far more rapidly than usual, and as a result much of the fruit is being stored at a more advanced stage of maturity than in the past. High temperatures affect the fruit after picking even more than during their life on the tree. It has been determined that apples mature as rapidly, if not a little more so, off the tree as upon it, if held at the same temperature in both cases. Therefore, unless the fruit is stored at a low temperature immediately after it is picked, its vitality and possible length of life will decrease very rapidly. Many growers pick the fruit at the proper time, but allow it to remain in the orchard for days, subject to alternate heating and cooling—conditions most unfavorable to keeping quality. Even after it is removed to the packing house it is often many days before it is packed and stored at the proper temperature. The effect of such delayed storage in contrast to immediate storage has been well brought out by the Department experiments. Boxes of fruit that had been picked, packed and stored within a few days were compared with boxes of exactly the same fruit, picked and packed at the same time, but delayed for two weeks before storing. This experiment has been carried on with a number of varieties of apples in the principal fruit sections of the Northwest for several years, so that approximately average results have been secured. The following table gives a summary of the results in four varieties:

IMMEDIATE VS. DELAYED STORAGE.
Three-year average for Esopus (Spitzenberg), Jonathan, Winesap and Rome Beauty. Percent of bad scald and of decay at withdrawal from storage, and after a ten-day holding period under market conditions.

	BAD SCALD At withdrawal	DECAY At withdrawal	BAD SCALD At 10 days later	DECAY At 10 days later
<i>First withdrawal, January:</i>				
Immediate	0.0	4.1	0.1	1.1
Delayed	0.1	6.7	0.6	2.2
<i>Second withdrawal, February:</i>				
Immediate	0.6	9.6	2.1	4.9
Delayed	0.9	12.0	4.4	7.0
<i>Third withdrawal, March:</i>				
Immediate	5.2	12.7	3.9	7.4
Delayed	11.5	22.7	7.3	13.2
<i>Fourth withdrawal, May:</i>				
Immediate	10.3	20.0	4.7	12.8
Delayed	17.0	31.4	7.9	18.2

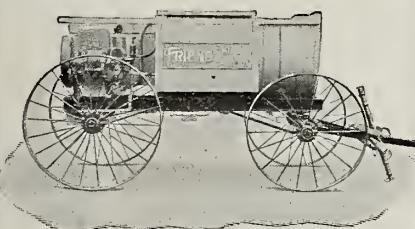
Note that ten days after the first withdrawal from storage, 4.1% of the immediate lot showed bad scald, as against 6.7% of the delayed lot, and ten days after the last withdrawal the difference is still greater, 20.0% of the immediate lot, against 31.4% of the delayed. The rate of decay showed similar differences at the same periods—1.1% of the immediate lots, ten days after the first inspection, and double that amount in the delayed lots, and ten days after the last inspection 12.8% in the immediate, with 18.2% in the delayed fruit.

This table needs little comment, for it shows plainly that at each of the inspections the amount of the deterioration was decidedly greater in the delayed storage lots, though, as previously stated, the delay began after the fruit had been packed. Undoubtedly if part of the delay had been in

Mr. Fruit Grower

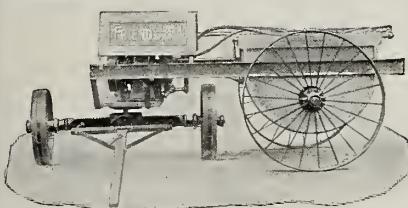
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California Spray Chemical Co., Watsonville, Cal.
J. A. Prentis, Cashmere, Wash.
M. V. Mathews, Paonia, Colo.

the orchard after picking and before packing the amount of decay would have been greater.

It is a well-known law that with each increase of 18 degrees Fahrenheit, the rapidity with which chemical changes take place is increased from two to three times, or applying this to fruit storage, at 50 degrees temperature the chemical changes which ultimately result in the death of the fruit would occur at least twice as rapidly as at 32 degrees. Thus the conclusion to be drawn is plainly that the lowest temperature at which the fruit can be held without danger of freezing is the one most favorable to its length of storage life. Fruit has been placed by the Department of Agriculture in cold storage, part held at 32 degrees and part at 35 degrees, and the results were briefly as follows: The first two inspections, in January and February, showed very little difference in the amount of scald or decay in normally good-keeping apples held at the two temperatures. However, at the third and fourth inspections, made toward the end of their storage life, the fruit held at 35 degrees showed considerably more decay than that stored at 32 degrees. In apples with a shorter storage life the differences were shown even in the first two inspections. These results are additional proof to the effect that low temperatures retard the ripening processes, and that as these processes are quickened by higher temperatures the length of life of the fruit is shortened and its susceptibility to disease increases.

Even after many years of successful cold storage of apples many persons cling to the belief that cold-storage apples will not keep as well upon removal as apples that are held throughout at a higher temperature. The Department investigations give very conclusive evidence that this opinion is erroneous. Apples from the same lot, placed in and removed from cold and common storage at the same time and held after removal under similar conditions, practically always favor the lower temperature, especially if removed fairly late in the storage season. Apples held in common storage are usually removed by January or February, while those in cold storage are often kept considerably later. People are apt to compare apples removed from common storage early in the season with those taken from cold storage a good deal later, and this is obviously unfair. Apples held in any kind of storage until they are overripe will undoubtedly deteriorate very rapidly upon withdrawal to a warm temperature. Just as cold retards ripening in storage, a cool temperature is best for fruit when held for any length of time after its removal from storage.

In spite of what has been said regarding the effects of temperatures higher than 32 degrees upon the keeping quality of apples, every grower here doubtless realizes the impossibility of placing all of the crop in cold storage. At the present time lack of

Only a Car of Apples

(Continued from October issue.)

The Plot Thickens!

Bunco Skinner at Bat!

(By C. C. P.)

“Curr-r-r-r-ssses!”

It was B. S., the Proud Produce Pirate, who emitted this exclamation through his clenched teeth.

His musical voice trembled with suppressed emotion. His jewelled fingers nervously clutched a telegram, the contents of which had caused this outburst, for it said:—“Won’t consign. Will only sell draft attached Bill of Lading. Ruggles of Red Gap.”

But instantly B. S. recovered his wonted poise. Again he was master of the situation. In honeyed tones he called his private secretary.

“Here, Miss Keys, take a wire to this sagebrush rabbit—‘Ruggles of Red Gap: Answering yours, date, will buy any part ten cars extra fancy winesaps three dollars box delivered. Answer. Bunco Skinner.’”

Daintily lighting another of his private stock Turkish Cigarettes, B. S. leaned back luxuriously and soliloquized—“Guess the overquoting B. S. consignment racket is about played out, but I’ve got a trick worth two of that.”—

This absorbing story will be continued in our next.

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storage space necessitates the shipping of great quantities of apples to Eastern markets throughout the harvesting season, with disastrous results to prices. With this state of affairs at present, and apple production on the increase certainly for many years to come, the question of finding storage space for the coming crops is one of the greatest problems confronting the fruitgrower of the Northwest. Cold-storage warehouses represent a large amount of capital in buildings and equipment, and also require a large operating capital. Some communities are justified in raising funds for a cold-storage plant, but many are not. It is nearly always possible, however, for a small community, a group of growers, or even one large grower to build a common or air-cooled storage house that will satisfactorily provide for their necessities. A common storage house of very large capacity may be built for six or eight thousand dollars, with slight operating expenses, as against fifty or a hundred thousand dollars and large running expenses for a cold-storage plant. Many common storage houses have already been built in various sections of the Northwest, and the Department of Agriculture has inspected many of them, held their fruit in several of them in the past, and has this season originated more extensive work with this type of storage.

Some of the common storage houses in the Northwest are well constructed and efficient, while others are unsatisfactory from many standpoints. Two essentials to be secured in the construction of a storage house are good insulation and an effective system of ventilation. Both of these are of utmost importance. A building must be well insulated to maintain a uniform temperature, and this is necessary if the fruit is to keep satisfactorily for any length of time. Even the briefest consideration of the details of construction and materials necessary to secure proper insulation would exceed the limits of my time, but it is highly important that the common storage be constructed to permit the minimum passage of heat or cold through its walls.

Ventilation is the next important consideration, and this may be achieved by simple air shafts, or more complicated systems, employing electric fans in the shafts. It is essential that outside air should not be admitted to the storage house when it is warmer than the air within the house. The owner of one storage house visited a short time ago was much distressed because his fruit was sweating. Upon investigation we found the ventilators all open, the electric fans in the shafts going, and the outside air, which was decidedly warmer than the air in the storage house, rushing in and condensing upon the cold fruit. This may serve to emphasize the necessity of constant and careful attention to the ventilators if the common storage is to be satisfactory.

Uniformity of temperature is a most important consideration in a common

storage house. It is better to hold the fruit at 40 degrees than to bring it down to 32 degrees at night and allow it to jump up to 45 degrees during the day. During the early part of the season, the temperature in a common storage house will probably remain relatively high, especially if cold nights are none too plentiful. This year the temperature in most of the common storage houses in the Northwest as late as the first of November was about 50 degrees. The daily receipts of warm fruit prevent the lowering of the temperature at a very rapid rate during the harvesting season. A greater effort should be made on the part of the grower to deliver the fruit to the storage house in as cool a condition as possible. Leaving the boxes of picked fruit in the orchard over night and hauling them to the storage house early in the morning would insure their arrival at low temperature. Fruit picked during the day and stored while still warm carries a large quantity of heat with it into the storage room, and when the boxes are stacked considerable time is required to reduce them to the temperature that they would reach if simply left in the orchard over night. After all of the fruit has been received it is a rather simple matter to reduce and hold the temperature at the point desired. Thirty-five degrees is about as low a temperature as most of the common storage houses maintain, but in some cases thirty-two degrees is reached and held. In either case, the length of time in the fall during which the fruit is held at a high temperature shows itself in the shortened life of the fruit. As mentioned before, early in its storage life an apple will show as little decay in common as in cold storage, but toward the middle of its storage life the difference becomes quite marked. In short, common storage may be as satisfactory as cold storage for fruit that is only to be kept until about the middle of the winter. Fruit to be held for longer periods should be placed in cold storage.

It seems entirely feasible to divide a common storage house into various compartments, each of which could be filled with fruit as rapidly as possible, and then held at a uniform temperature. This would render the common storage more nearly as efficient as the cold storage, but until some such plan has been worked out the preceding statements must hold.

In conclusion, let me say that although the experiments conducted by the Department of Agriculture along the lines indicated are by no means complete, and in fact in some directions, such as the investigations into common storage, can only be said to have begun, I have given only such results as are confirmed by the evidence of several years' work. In brief these are: 1. Most varieties of apples for storage should be picked at maturity. 2. Apples should have the least possible delay from the tree to the storage. 3. For cold storage a temperature of 32 degrees is usually the most satisfactory. 4. In the case of those varie-



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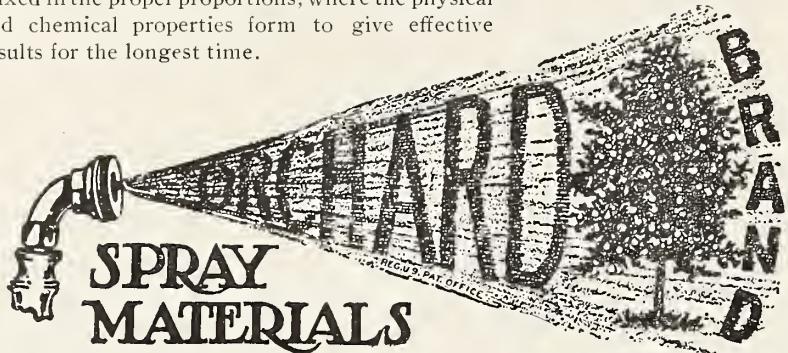
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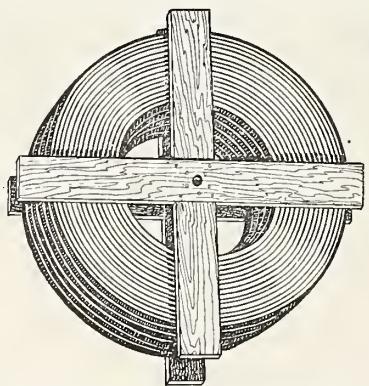
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ties for which a short storage is desired, common storage may be made as satisfactory as cold storage.

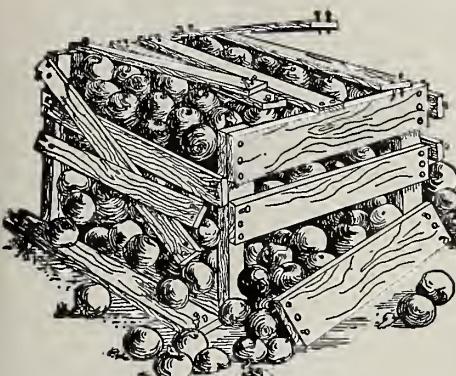
The tables used are from "Cold Storage of Apples, with Special Reference to Conditions in the Pacific Northwest," U. S. Department of Agriculture Bulletin, to be published at Washington in the near future, and for a more full account of the results of the apple storage experiments, I would recommend this bulletin to your attention.

Trained Dairymen Employed

Every member of the classes graduating in dairying at the Oregon Agricultural College in the years 1914 and 1915, twenty-five in all, has taken employment in industries directly related to the work of his special training in college. The eighteen members of the class of '15 have employment in their specialties, largely as a result of the policy of the dairy department in placing its graduates in positions advantageous to themselves and to their employers. Six of the eighteen are employed as official testers in cow-testing associations. Three have found positions as superintendents of public institutions interested in dairying. Two are managing co-operative creameries. One is milk inspector in a metropolitan bureau of health. Two are butter makers in commercial creameries, and two are taking advanced work in college. Of these the manager of a large dairy ranch receives the highest salary, \$1,200 per year, with residence accommodations. Three others receive \$1,200 without accessories. Two receive \$1,000 each, and several receive \$750 each in money and their board and rooms, approximating as much more. The seven graduates of the 1914 class also receive satisfactory salaries in performing the work that the college trained them to do. By thus following the careers of its graduates and noting the degree of efficiency of their work, the college is able to determine the efficiency of its own work so far as those students are concerned. This situation rarely prevails in educational work, wherein the relation between the training and the later life work is a baffling problem. Those who support public education as well as those who make use of its opportunities are beginning to insist on an answer to this problem, which to a considerable degree is found in the data collected.

The British Columbia fruit crop,—peach and apricot,—show a considerable increase over last year, although in some districts leaf-curl has been quite extensive. The pear crop is about 25 per cent larger than in 1914; the plum crop about 90 per cent of last year; the cherry crop was larger than the 1914 crop and the apple crop is reported about 70 per cent of last year.

Southern Idaho expects to ship 1,500 carloads of apples this season (probably an overestimate). The greater proportion of these will be shipped from Payette, which will probably ship somewhere around 500 cars.



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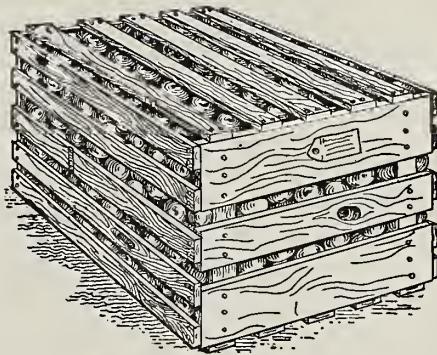
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Apple Marketing—Conditions Show Marked Improvement

[Furnished by Office of Markets and Rural Organization, United States Department of Agriculture]

THE marketing of the 1915 apple crop opens with more encouragement to growers and dealers than they found in the prospects for the 1914 crop. According to investigations conducted by the Bureau of Crop Estimates last reports show the condition of the crop to be approximately 80 per cent of the yield last year. The merchantable supply or commercial crop, as distinguished from total production, therefore, would appear to be approximately 40,000,000 barrels at the highest, whereas the commercial crop of 1914 is variously estimated as having been from

50,000,000 to 60,000,000 barrels. It is reported that, in the large areas where barreled apples are produced, the crop of early fall varieties is relatively larger than the crop of winter varieties. This would seem to indicate that within a very short time a considerable quantity of apples included in the bureau's estimates will be eliminated from consideration. Furthermore, it is said that the crop in some sections is seriously affected with fungus and blotch. To the extent that these defects prevail will the merchantable supply be reduced. Under these conditions, therefore, it would appear that the commercial crop of winter varieties may be considerably smaller than the total production the report would seem to show.

Business conditions show a marked improvement over last season, according to trade reports received by the Office of Markets and Rural Organization. The South, particularly, is in easier condition, and it is said that the United Kingdom and countries in the north of Europe will take liberal quantities. However, with reference to Europe, it is to be remembered that steamer space is in great demand. It is reported that all cold chambers are under contract with meat packers until the first of the year, and ordinary space is said to be more limited than in 1914. In shipping circles it is maintained that Europe may not be expected to take the same quantities as last year. According to trade reports the abundance and cheapness of apples during the past year will be reflected in a satisfactory consumption this year. In other words, it is thought that the habit of eating apples may be expected to hold over from last season. However, one or two correspondents maintain that the conditions of one season do not affect the next insofar as consumption is concerned.

It is generally reported that abundant storage space will be available and that comparatively there will be no great difficulty in financing the movement of the crop. Conditions for liberal consumption are said to be good in most markets, and altogether there is a de-

cided feeling of optimism on the part of those concerned, as compared with absolute gloom this time last year. It is to be remembered, however, that 40,000,000 barrels of merchantable apples, which is thought to be the maximum estimate for this year, is a goodly supply, and that to assure a steady normal movement throughout to the conclusion of the season next spring, large quantities must pass into consumption between now and the first of the year. Unreasonably high prices at this time will mean a curtailment of consumption and the storing by the growers of

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larger quantities than the conditions might justify, with the result that later on they might receive net prices below the level of opening values. By this it is not meant that growers ought to sell now for less than market value, nor is it meant that buyers are to be encouraged in depressing opening values. The outlook is normally encouraging for satisfactory profits to all concerned if good judgment is used, and it is meant to urge upon growers and dealers alike the advisability of breaking deadlocks with reasonable concessions on the part of all. Arbitrary ideas of values should be avoided, so that the movement of the crop may proceed in a healthy way. Unfortunately, when the demand for apples is good, many growers and packers seem to feel that poor grading is justified, and is such years there is a tendency to lower standards. Attention is called to the fact that no condition can justify anything but an honest pack. For a poor grade and shoddy pack the producer ultimately must pay, although temporarily the packer may receive an advantage. Apples should be sold for just what they are, according to the recognized grades. Whether or not the price may be high, growers and dealers alike should adhere strictly to that policy.

Under all conditions there are certain fundamental processes that ought to be observed in preparing the crop for market if success is to be assured. The fruit should be picked and packed in such condition as to insure it against abnormal deterioration. With perishable varieties having a long ripening season it is suggested that growers should not attempt to harvest the crop at one picking, but rather should glean the trees for only such fruit as is ready to come off, repeating the process until the crop has been picked in uniform condition. The advantage is that the



Profit from Fruit

is increased if the fruit is borne on trees planted in soil that contains the right amount and the right kind of plant food. For such trees will yield fruit in maximum quantity and of improved quality.

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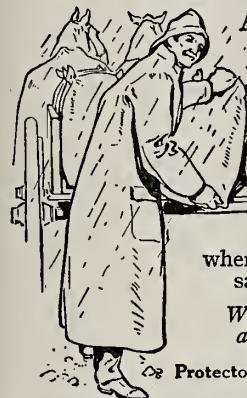
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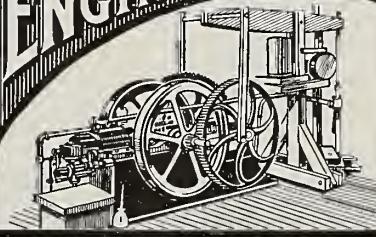
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shipping period may begin earlier and last longer, thereby securing greater time for effecting distribution. Furthermore, if all the fruit is harvested at the same time, it is to be remembered that shipments represent extreme stages of maturity, ranging from ripe to green in the same package, and that frequently toward the end of the season overripe condition of a portion of the crop may result from failure to pick first only what is in condition for marketing. Careful handling from tree to car is necessary to prevent deterioration. It is not difficult to understand why a lot of fruit does not arrive in the market in prime condition if it is picked and piled on the ground in the hot sun, placed in packages in a heated condition, and finally hauled in wagons without covers or springs over rough roads. With proper facilities, apples picked on hot days should not be packed until the following day. For this purpose shelter should be provided in order that the fruit may be packed in a cool, dry condition. Growers who have no packing sheds should either build them or arrange to use their barn floors. Wagons should be equipped with springs and covers provided for the protection of the fruit from the weather. Culls and cider stock should be eliminated from the better grades and as far as possible diverted to cider mills, canneries and evaporators. While in short-crop years there is a fair demand for low-class apples, still by filling the autumn markets with poor stocks it is possible to obstruct seriously the disposition of the standard grades, and force into cold storage larger quantities than the conditions may justify. In general, only long keeping, standard pack apples should be placed in the coolers, though it is frequently profitable to store for relatively short periods such sorts as Grimes, Wealthy and Jonathan, for withdrawal during autumn and early winter as the demand justifies. In packing fruit for storage special care should be exercised to pick the fruit in sound condition, pack it carefully, and rush it into storage without delay. Such methods add materially to the life of the product.

Owing to geographic location, some important apple-producing states have the natural advantage of an early season. It would be folly for such states not to profit by that advantage. It is possible for growers so situated to leave their crop on the trees until the period of greatest movement, and frequently in years past they have suffered great loss by doing so. The Southern states of the apple belt should begin early and market the greatest portion possible prior to the period of greatest movement, and thereby avoid competition with the producing areas of the northern belt. On the other hand, states that go to market latest should be in no hurry to rush the markets during the period of greatest movement. In brief, the crop should be distributed throughout the longest time possible, cold and dry storages being judiciously utilized for conservation. Small towns outside

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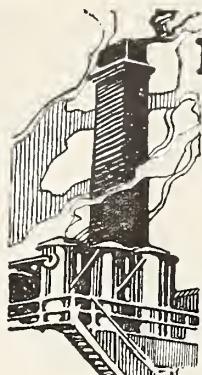
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We Have a Story for You



of the apple belt are often poorly supplied, even in large crop years. Growers of the Middle West have taken advantage of this condition by going to such towns with cars of apples and selling on the track. In order to succeed with this method the shippers should know conditions of supply and demand in the town selected, ascertain the railway and township regulations controlling track sales, and precede delivery of the car by judicious advertising. The mayor can give information as to whether a license is required, and the railway agent as to whether track sales are allowed. Insofar as the apple grower is concerned, co-operation in distribution and marketing is highly commended as an economic system for securing judicious handling. Of course it would be impracticable for growers to organize upon the eve of crop movement, because disaster would likely result as the consequence of too little time for perfecting business arrangements. However, in communities where co-operative packing and selling agencies are operated, the growers should do all possible to strengthen such exchanges with their patronage and counsel. The disloyalty of members is the chief element of failure in co-operative circles, and apple growers are strongly urged to stand by their associations as the best way to solve the problems that are common to all.

Apple Anthracnose or Black Spot Canker

This disease is known to occur on the Pacific Coast west of the Cascade Mountains in Oregon, Washington and British Columbia, and has more recently been reported in the south central part of Washington in the Columbia River Valley. Frequently it is the matter of inquiry by orchardists in the eastern and central parts of Washington. In

THE COST

is given on page 4.

There are also other points of interest to orchardists.

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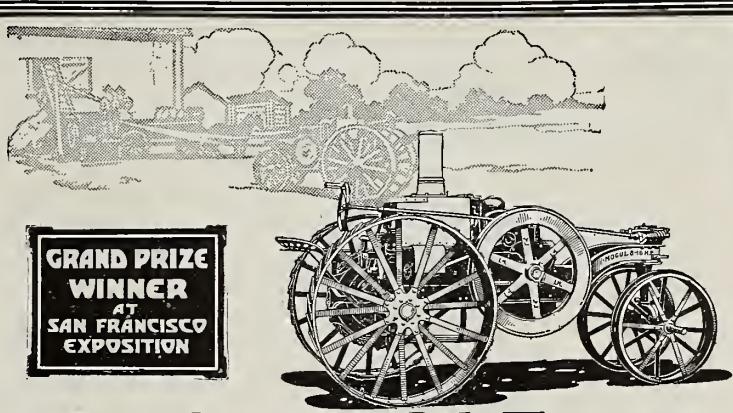
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order to acquaint the grower with the nature of the disease, its effects, and methods of control, the following statement is issued by Mr. D. C. George, assistant plant pathologist of the Experiment Station at Pullman:

Apple anthracnose, or black spot canker, manifests itself as a twig and branch canker on the apple and pear, and as a storage rot on the fruits of the apple and quince. The twig and branch form appears as dark colored, sunken areas or cankers in the bark of the younger growth. It is especially injurious on branches under two or three inches in diameter, only occasionally being found on the thick bark of the larger branches. Frequently several of these cankers coalesce and completely girdle the branch. Young trees are sometimes killed by this girdling. The young cankers begin their development in the fall, usually about the first of November. They appear on the bark as small circular spots, reddish brown to black in color. Beneath these spots a water soaked appearance is noticed, which extends to the cambium layer. During the winter months development is retarded, but becomes vigorous with the renewed activity of the host in early spring. As the spots enlarge they become elliptical in shape, more or less depressed and smooth, and the bark dries and slightly cracks at the advancing edge. The cankers are mature in size by the last of June or a little later and vary from one-quarter of an inch to six inches in length by one-quarter of an inch to five inches in width. About this time small elevations or pustules, more or less conical in shape, appear in the cankered area. Later, about midsummer, these pustules crack open and expose the spore-bearing mass of fungous tissue. In the late autumn the cankered area is separated from the healthy tissue by a slight ridge due to the formation of callus. When the



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BETTER FRUIT

canker becomes old, usually the second year, the bark cracks away from the edges, becomes loose and drops out, leaving unsightly scars. As stated previously, the disease is known to cause a storage rot of the fruit. It first appears on the surface as small, light brown, circular spots of rotting tissue. These spots generally enlarge and later change to very dark or black, eventually becoming dry, depressed and rather tough. Pustules similar to those formed in the cankers soon develop, quite commonly making their appearance in concentric circles.

Anthraenose is caused by a parasitic fungus known as "Neofabrea malicorticis." It produces two kinds of spores or reproductive bodies. The summer spores, or conidia, are formed during the first year of the development of the canker. They are mature by late summer or fall and are ejected in a gelatinous mass from each of the small pustules found on the cankers. These spores are readily separated by water, rain, dew, or certain summer sprays serving as agents in this respect. On being liberated they are scattered by various agencies and each one is capable of producing a new infection. The winter spores, or ascospores, are developed the second year, within small club shaped structures borne in disk-like bodies that occupy the position of the pustules of the previous season. Following the fall rains these spores are discharged with force and are carried away by the wind. Like the conidia, upon germination they are capable of producing new infections. It has been found that conidiospores are also developed from old layers around the edges of the pustules producing the ascospore stage and also in the bark of cankers three years old. If the bark drops to the ground at the end of the first year, the winter spores may be developed in such bark on the ground.

Thorough spraying and pruning are essential in order to control the disease. The spraying should be done immediately after the fruit is picked, as at this time the spores are most abundant and new infections most likely to take place. The 6-6-50 bordeaux is recommended. If the fall rains begin early and the trees are harboring old cankers an additional spraying about three weeks later is advisable. Too much emphasis cannot be placed on thorough pruning. It is advisable, where possible, to do this before the first spraying. All small twigs and branches showing any signs of the disease should be removed. Old cankers on the larger branches should be cut out without fail, as they are very serious sources of spore production, and the wounds should be protected in order to keep out wood-rotting fungi and insect pests. The cut edges of the bark and the cambium should be painted with shellac, and as soon as this dries the entire wound may be covered with coal tar or any good paint. The prunings and all bark removed from the cankers should be burned.—Washington State Experiment Station Bulletin.

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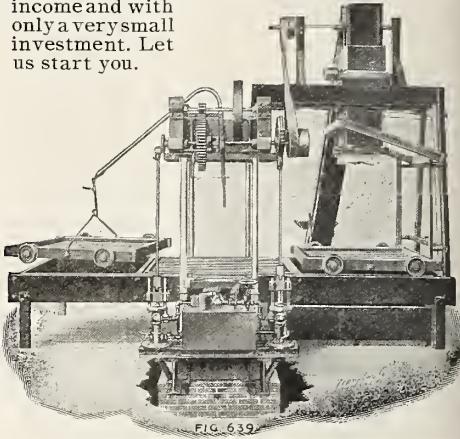


FIG. 639
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Keep Cider Sweet.

Cider may be kept either perfectly sweet or with whatever "bead" the taste of the user suggests, according to Miss Carrie Pancoast, of the Missouri College of Agriculture. It may be canned immediately or allowed to stand for a few days, but in either case the method used includes filling fruit jars with the cider and adding a tablespoonful of sugar to each quart, if desired. Place the rubber and top in position and tighten partially, in case of glass jars; or if tin is used, cap and tip the cans. An ordinary washtub or similar vessel may be used in sterilizing. Laths or thin boards should be laid across the bottom to avoid heating the glass to rapidly and cracking it. Put in water enough to fill the vessel an inch or two above the jars, heat to boiling, put the jars in, and let the boiling continue for ten minutes. Then remove, tighten the covers, and invert in order to test the lids while cooling. Other processes that may be used involve sterilizing for eight minutes with a water seal outfit, for four minutes under five pounds' pressure with a steam pressure outfit, or for two minutes with an aluminum pressure cooker.

Winter Injury to Fruit Trees.

A great many inquiries have come to the horticultural division of the Experiment Station asking for information about treatment of winter injured trees. There are two forms of winter injury more common than others. In the first the bark is killed directly, and it often splits on the trunk and larger limbs and turns dark brown on the smaller branches. The surface bark on the small limbs is often raised, as if blistered. This may occur in small circular or irregular areas, or the entire limb may be affected. The small limbs

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Delineator	1.50	Review of Reviews.....	3.00
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Better Fruit.....	1.00	Better Fruit.....	1.00
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Total	\$5.50	All for	2.60
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		Better Fruit.....	1.00
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FRED EBERLE, Manager

NORTH YAKIMA, WASHINGTON

should be cut away and the split bark covered with grafting wax or bound down with strips of burlap or cloth. This should be done as soon as the injury is noticed. The second form of injury is usually not noticeable until growth starts, unless the inner bark is examined. This is usually yellow or light brown. The growth of the tree is late in starting and then the side buds develop only small, slender leaves. The side buds on the previous summer's growth of wood often fail to start growth, or after starting die before the first leaves unfold. The bark often remains green through the summer and dies the following winter. All branches that fail to start, and those that make a very poor growth, should be cut away early in the season. The best cultivation and care possible should be given to enable the tree to recover normal vigor. Excessive pruning often does more harm than good. Plant some crop in the orchard in midsummer, or cease cultivation and irrigation early enough to cause the trees to thoroughly ripen their wood before cold weather occurs.—Washington State Experiment Station Bulletin.

Coming Events

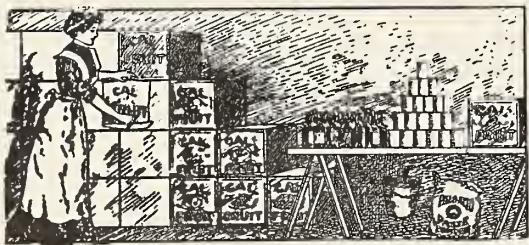
Arizona State Fair, Phoenix, Arizona, November 8 to 13.

Cascade International Stock Show, North Yakima, Washington, November 22 to 27.

Lewiswton Livestock Show, Lewiston, Idaho, November 29 to December 4.

Pacific International Livestock Exposition, North Portland, Oregon, December 6 to 11.

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